Medical Times

A Monthly Journal of Medicine, Surgery and the Collateral Sciences

Vol. XL., No. 3 **NEW YORK, MARCH, 1912** **Fifteen Cents a Copy One Dollar a Year**

General Scientific

HOW TO USE QUININ AND UREA HYDROCHLORID; ESPECIALLY FOR SYSTEMIC EFFECT BY INJECTION IN MALARIA AND PNEUMONIA.

SOLOMON SOLIS COHEN, M. D.
Professor of Clinical Medicine in Jefferson Medical College.
Philadelphia.

Quinin and urea hydrochlorid—long known in Germany as *chininum bimuriaticum carbamidatum* and used with confidence by some American physicians, most of whom learned of it a generation ago from Professor Roberts Bartholow, or more recently from his pupils—has within a few years come into prominence as a local anesthetic. Of its use as such, I do not now wish to speak, except to call attention to its great value in acute tonsilitis and in tuberculosis of the larynx. A solution of 1:10 or less is usually strong enough, but even a 20 to 50 per cent. solution may be employed if necessary. It can be applied by spray, sponge, brush, cotton applicator, etc., as may be most feasible in the individual instance. Sometimes the patient may simply take a teaspoonful or two of the solution in his mouth and holding it back toward the painful region of the tonsils or epiglottis, move it gently to and fro by action of the pharyngeal muscles. This is somewhat easier than gargling, and gives more relief. Done 10 minutes before the taking of food, it will sometimes permit nourishment to be given in cases of ulceration of the epiglottis or other painful tuberculous lesion in which all other methods of relief have proved unavailing.

Neither in tuberculosis nor in tonsilitis need the patient be apprehensive of any danger from swallowing the solution, as a dose of 5 grains or so, three times a day, would not ordinarily be hurtful, and in febrile cases might be beneficial. Sometimes, indeed, the specific direction to swallow a part of the solution—or even all of it—is given.

It is, however, more particularly with the systemic effect of the drug and its administration in malaria and in pneumonia that this note deals. I have received many inquiries concerning particular details of the method of administration employed by me in the treatment of acute lobar pneumonia and acute lobular pneumonia by massive doses of quinin and urea hydrochlorid—the favorable influence of which I reported some months ago to the Association of American Physicians (*Am. Jour. Med. Sci.*, Jan., 1912, p. 40)—and this is the easiest method of answering at once all my correspondents.

The drug may, of course, be given by the mouth in solution, powder or capsule, as any other salt of the cinchona alkaloid. It is probably more active, grain for grain, than any other quinin preparation. Possibly the urea is a linking body; possibly it is merely a question of solubility. I do not know the explanation, but the fact is evident.

The peculiar advantage of the urea compound over the other quinin salts, however, is its availability for hypodermic and intramuscular injections; possibly for intravenous injection also, although I have never found the latter method necessary and thus have no experience to report. A possible danger is injury to the vessel wall.

The superiority of the carbamide for injections is owing to its high solubility. It will dissolve in its own weight of water, especially hot water, and an ordinary syringeful may thus contain from 15 to 18 grains (1 to 1.2 gm.) if necessary. The preferable solution is 50 per cent., and the ordinary dose is 1 gm. (15 grains) in 2 c.c. of water.

In *malaria* of the types ordinarily seen in northern latitudes, a single injection of this strength will cause suspension of the paroxysms for from a week to a fortnight (6½ to 13½ days). One injection daily for a week suffices to bring about complete recovery in the ordinary case. After this, to make sure against chronic infection or sequels, the drug should be continued in doses of 10 grains, in capsule by the mouth, daily, for another week; and then administered once a week, in the same way, for two or three months.

In *pernicious* malaria, larger and more frequent doses are probably needed.

In *pneumonia*, the dose varies with the age and vigor of the patient, the general severity of the case and the time elapsing from initial chill to the beginning of treatment. If the case is seen on the first day, and the patient is a vigorous adult under 50 years of age, the effort should be made to give as much quinin as possible within the first 24 hours. The initial injection may be 25 grains (1.6 gm.), and this, or a smaller dose, may be repeated in three or four hours, according to the effect produced. Aged persons, weak persons, children receive proportionately smaller doses. Should the case be first seen on the third day, the initial dose should be governed somewhat by the height of the temperature and the severity of the general symptoms. If the temperature exceeds 104° F., and the

patient markedly labors for breath, the first injection may be 25 grains; otherwise 15 grains should be given and this dose repeated every third hour or fourth hour, according to circumstances, until the temperature falls and remains below 102.2° F.; to be repeated when the temperature again rises. While the object of the treatment is not antipyretic, the temperature line of 102° F. is taken as an approximate index of the severity of the infection, or rather of the toxemia, on the one hand, and on the other hand, of the adequacy of the patient's reaction. It is not desirable to reduce temperature abruptly below 102° by any form of treatment, except, perhaps, the use of specific bacterin.

Sometimes a single injection of 15 to 25 grains (1 to 1.6 gm.) suffices. Usually, however, from six to ten grams or more are given in the course of from 48 to 72 hours. The temperature quickly falls after the first injection; sometimes remaining down, but more frequently again ascending, and thus indicating the necessity for renewed injections. Pulse rate also falls, and with it, at first, blood pressure; but the latter, in cases of favorable prognosis, quickly regains its former level and even tends to go higher.

In my more recent experience I have injected immediately after the quinin, or with it, about one-half grain (0.03 gm.) of cocain hydrochlorid to keep up the vascular pressure; and this dose of cocain is repeated as often as necessary—which may be several times a day, once or twice in an attack, or not at all. The indication is a tendency for the line representing systolic blood pressure measured in millimeters of mercury, and charted upon the same vertical as the line representing pulse frequency (in beats per minute) to fall below the latter. Thus, if the pulse rate is 160 beats per minute, and the systolic blood pressure is 100 mm. Hg., there is indication of grave danger. If pulse rate and systolic blood pressure are each 130, the condition is one of doubtful equilibrium. If blood pressure can be brought up to 130, and pulse frequency reduced to 120 or less, the outlook is favorable.

It will be understood, of course, that these figures are merely illustrations. Although the blood pressure should be only 110, it might be still a favorable sign, provided the pulse rate was at the same time 100 or less. It is *the distance of pressure above or below frequency* that is of significance. This important sign was first brought out in a somewhat casual manner by G. A. Gibson of Edinburgh; and afterwards emphasized and made prominent by H. A. Hare of Philadelphia. I am abundantly able to confirm its value from personal observation. It is not infallible, but it is a good guide in treatment. Fall of pressure with rapidity of pulse indicates vasomotor depression, as well as cardiac weakness.

To raise blood pressure and to stimulate and sustain the heart when necessary, the physician may employ, if he so prefers, epinephrin, pituitrin, camphor, musk, atropin or strychnin with, or instead of, cocain. Digitalis is too slow and in the presence of fever, too uncertain. The adrenal principle is prompt, but its action is fugacious. Its association with cocain or camphor is usually efficacious; quick response coming from one agent, sustained effect from the other.

To resume the statement of the effect of the quinin and urea injection, its most marked effect is upon the respiration, the rate of which falls proportionately lower than temperature or pulse frequency. Even when its rapidity is not markedly diminished, breathing becomes much less labored and distressful.

The most significant fact of all is that cinchonism does not develop under these enormous doses of the most active quinin salt. Should it do so, it would be an indication for withdrawal of the drug—at least until the quinin symptoms had abated.

The *disadvantage* of quinin and urea hydrochlorid injections is, that *handled carelessly, they may excite cellulitis, abscess or slough.* In my early use of the drug (1884) I learned to avoid this by precautions (later stated). Since then I have made and have had made thousands of such injections without accident.

All the instruments to be used are sterilized by boiling. The skin over the part into which the injection is to be made is cleansed with green soap and water; and then an area of some two inches in diameter is painted with tincture of iodin. A high pressure syringe is used and the long needle attached thereto is plunged deeply into the muscle. Care is taken to expel all the contents of the syringe, so that in its withdrawal none of the solution shall be dropped on the surrounding tissue. The puncture is then sealed with iodoform-collodion.

I use by preference a 50 per cent. solution of the drug in hot sterile water; but when the capacity of the syringe available is not sufficient for the quantity of water necessary to make a 50 per cent. solution, one needs simply to dissolve the quantity of quinin and urea hydrochlorid to be used in a syringeful of hot water. I have not seen any local harm from a concentrated solution when due care is observed, in accordance with the directions just given. The site of injection may be arm, back, thigh, buttock, or any convenient place where there is sufficient muscular tissue. Meltzer's site—the spinal muscles of the lumbar region—may be chosen when quick result is a matter of urgency.

In treating pneumonia dependence is not placed on quinin alone. Fresh air (out of doors, if possible); water; saline infusion, if necessary; some alkaline salt or salts in sufficient quantity to keep the urine at least neutral, and preferably alkaline; all the devices of good nursing and good feeding; external applications of heat; inhalation of oxygen, if indicated; administration of any medicine called for by symptoms—these and whatever else may be useful, are to be employed additionally. Their discussion, however, is not here called for.

Whether the treatment of pneumonia here outlined will be superseded by the use of specific bacterin or of mixed bacterins is as yet impossible to predict. In the ordinary case in a person under 50 years of age, seen before the third day, one may be as efficacious as the other. The bacterin method may prove superior in late stages, in old persons and in the most severe cases. When bacterin is unavailable, the use of large doses of quinin as promptly as possible, seems to me after nearly eight years comparative study, and after 28 years experience with many methods, by far the best routine as yet proposed.

TWO PANCREATIC SYNDROMES OCCURRING IN THE TUBERCULOUS: INTENSIVE PANCREATIZATION IN THEIR TREATMENT.

PROFESSOR MAURICE LOEPER.

Authoritative English presentation by Dr. Reboul of *Progrès médical* for the MEDICAL TIMES.

Paris, France.

The part played by the pancreas in nutrition is important as well as complex; its secretion seems to be twofold; the pancreatic juice and a substance of unknown nature which regulates the equilibrium of glucose in the system, as well as other processes of nutrition which are less exactly defined. These two secretions seem to originate, the former in the glandular acini and in Wirsung's canaliculi, and the latter in Langerhans' islets and in the circulatory system of the gland. Therefore two classes of symptoms will be the clinical result of pancreatic insufficiency: dyspeptic symptoms caused by insufficient modification of fat, carbohydrates and proteids; and symptoms resulting in disorders of the nutrition, the most important of which are hyperglycoemia, glycosuria and perhaps azoturia, lipuria and polyuria. As to hypersecretion of the pancreas there is little data and it is next to impossible to ascribe definite symptoms to this condition. In short, the pancreas must be

considered as a most important gland, the secretions of which regulate the functions of the system, and this is especially true as regards consumptive patients.

Diarrhoea is the most frequent symptom of pancreatic insufficiency in consumptive patients, and very often it bears very little or no relation to consumption, so that it may be termed "dyspeptic diarrhoea." A careful chemical and microscopical examination shows an abnormal amount of food residues, fat, carbohydrates, muscular fibres, etc., and the data of coprology is then quite typical of pancreatic insufficiency. In some cases the amount of amylase in the blood is distinctly below the normal, and in some of the patients observed by Prof. Loeper it had fallen to 10 or even 8, instead of 17, which is the normal amount, according to Achard and Clerc. Sometimes there is no diarrhoea or no obvious sign of digestive disorders, but then an abnormal loss of weight out of proportion with the pulmonary lesions, or a slight glycosuria, lead to a diagnosis which is soon confirmed by the examination of the foeces.

Conversely hypersecretion of the pancreas has been not unfrequently observed by Prof. Loeper at the beginning of consumption. Its symptoms are: good appetite, even bulimia, and at the same time distinct wasting and increase of amylase in the blood and urine; presence of a proteolytic urinary ferment which very likely is trypsin sometimes; after the meals, some temporary glycosuria; there is also an increase of indican in the urine, although there is no diarrhœa, and an increase of sulfo-ethers, although there are no intestinal fermentations; Cammidge's reaction is quite positive and in the fœces there is an abnormal amount of very active amylase. The microscopical examination detects no food residues, and clinically there is neither constipation nor diarrhœa.

Tuberculosis of the pancreas is not very commonly met with, but Prof. Lœper has examined lately the pancreas of 16 patients who had died of consumption, and he gives most interesting information as regards morbid anatomy. Some of the pancreas which he has examined were normal, but most of them were congested, œdematous, infiltrated with lymphocytes, and with perilobular, intralobular and multicellular sclerosis; granular and especially fatty degeneration was frequent, the latter in about 50%. In some of the pancreas examined there was evidence of hyperplastic reactions which were well marked not only on the lobules but also on the islets of Langerhans.

These microscopical and macroscopical post-mortem appearances have been confirmed by the results of experiments on animals, conducted with Dr. Gh. Esmonet, and which Prof. Lœper records in detail.

As regards therapeutics, Prof. Lœper holds that his conclusions are of a great clinical importance, and he has been led to recommend what he terms the intensive pancreatinization of consumptive patients*; this method has given him very satisfactory results in cases of consumption where sclerotic or degenerative atrophy of the pancreas has followed hypersecretion, since it is then necessary to stimulate the pancreatic secretion.

Japanese Tribute to Robert Koch.

A profound recognition of the worth of Robert Koch was evidenced by the Minister of Public Education, Mr. Kamatsubara, who attended a religious service of the Shintoists in memory of Koch. *Le Progrès médical*, Paris, commented upon this, quoting *Les Nouvelles*, saying that Japan thus reconciles its ancient traditions with the results of Western intercourse. The peculiar attitude of the Eastern mind, regarding ancestors as immortal in influence and astral in power, strikes a new harmony in joining this scientist to the ancient theogonies.

*Lœper & Esmonet, la pancréatinisation intensive dans la tuberculose. *Congrès Français de Médecine*, Paris, 1910, and *Bulletin Médical*, October, 1910.

A PLEA FOR A RENAISSANCE IN THE STUDY OF THE MATERIA MEDICA.

FINLEY ELLINGWOOD, M. D.
Chicago, Ill.

It is generally conceded that the study of Materia Medica and Therapeutics has been neglected during the past two or three decades. The interest taken in preventive medicine and in surgery has absorbed the attention of the profession. The study of bacteriology, pathology and microscopy and the development of laboratory methods of study of drug action, has given our profession the reputation of having accomplished more brilliant, scientific achievements than any other profession.

With this advancement, however, the most important branch of the entire medical curriculum has been neglected, especially the clinical observation of the action of single drugs for exact conditions of disease. The recording and comparison of the bedside observations have received but little attention. What can be more important than for the physician to know precisely how a single drug acts and what specific conditions will invariably respond to its influence? It is absolutely imperative that the profession become aroused at once to the importance of the immediate revival —a renaissance in the study of individual medicines.

Four or five years ago the editor of the *Ladies' Home Journal* made some observations among physicians in Philadelphia and New York, and declared that a large number were using proprietary remedies, and remedies of unknown composition, with no first knowledge as to the action of these compounds. He claimed that there was gross ignorance on the part of the profession as to the action of drugs. While some denied the assertions, many men openly acknowledged the truth of his statements.

In the study of medicines there can only be to the unprejudiced mind one correct method: closely observe the action of a single remedy upon a person in a condition of disease.

Perhaps some previous suggestion has been empirically made as to how that remedy should act. Taking this thought as a guide it is by no means difficult to carefully study its constant action upon the same or similar conditions; to determine its modifying influences, its side influences until its correct action is positively impressed upon the observer's mind. This study will in some cases be very materially promoted by a knowledge of the laboratory results obtained from pharmacological experiments. This is especially true of those remedies developing toxic properties.

These observations, recorded and scientifically compared and corroborated, determine how each remedy will act upon exact conditions of disease, one or more as the case may be, and when the total of these conditions is summed up, it will be found that they include, when properly grouped, most of the diseases which are usually designated by a single name, or, on the other hand, it will be observed, as is well known, that total disease groups are made up of exact conditions, although these conditions vary most materially in the same disease with different patients.

The physician in everyday practice is continuously meeting these single conditions which in many cases are cured as minor conditions; they may seem at first to be of little importance, but if permitted to develop, they exhibit pathological factors which often become of serious import. Every physician has his ability to cure astonishingly enhanced by knowing how to meet each little condition as it arises promptly and successfully with a single remedy. It is these common everyday perplexing conditions that tax the skill of the best practitioners.

Disease groups are made up of separate and distinct conditions. As soon as each condition is understood and can be combated with a single remedy, with which the pre-

scriber is familiar, a correct combination of two or more remedies can at once be made upon which the physician can positively depend to correct the basic underlying conditions upon which the disease depends. Thus in a rational, common-sense manner a cure is at once effected. If these conditions are met as soon as they appear or shortly after, many pathological results which are sure to follow, often inducing severe disease, will be prevented.

There are thousands of physicians in the United States who believe that a correct study of drugs must be made with reference to their clinical action upon exact conditions of disease.

As other methods of drug study have proved unsatisfactory, and as physicians at large have not adopted any systematic course of study like this, the profession is deplorably at sea in its knowledge of drugs. Would it not be wise, therefore, for the total profession in an unprejudiced and thoughtful manner to consider this as a correct method of drug study?

The writer is so far convinced of the truth of this, that he believes failure to cure disease is due to lack of knowledge, or inversely, that ignorance alone on the part of physicians is responsible for the fact that disease is not cured, and cured promptly. He believes that disease will ultimately be subdued in whole or in part by remedial measures, because so great is the truth underlying this position that the profession must ultimately adopt it. He also believes that it is criminal to deprive patients of the benefits of this knowledge, and the crime reverts as much to the teachers of medicine as to the individual physician.

The study of therapeutics is the most difficult course that can be undertaken. It is the most absorbing; it demands the utmost mental concentration, and it cannot be quickly acquired. The elements and factors of this knowledge must be begun with the first study, and must be persistently and continually interwoven into all the studies of the entire college course. When this basic knowledge is acquired, and the student as a physician enters upon his professional duties, he will have found that his knowledge is largely suggestive, but correct so that his own observations, confirming the suggestions and firmly impressing the truths concerning drug action upon his mind, make him in a short time successful. How deeply could the average physician go into the exact action of a single remedy, if he were writing an extemporaneous essay upon it? Take digitalis or aconite. How much could be said without previous research of the rational influence of these remedies upon the system, and upon the deductions that can be made from the physiological actions of these agents, which would apply directly to the cure of exact and precise diseased conditions in line with their physiological action?

How many of the readers can take as common a remedy as calomel and readily explain its action upon a strict physiological basis? It would be indeed a curiosity to compare the essays of any number of the very best therapeutists of the present day as to the precise action of this remedy. Could each reader give a satisfactory reason why atropine or belladonna should be given in conditions in line strictly with its action either upon health processes or upon pathological conditions?

Having satisfied ourselves concerning these very conspicuous and common remedies, what would our common knowledge be concerning the accurate specific action of the following: Quinine; ergot, in its influence on the circulation of the nerve centers; hydrastis as a nerve tonic to improve the nerve power of all organs; aconite; veratrum; ipecac, other than an emetic; podophyllum; turpentine and henbane.

In the studies of the individual medicines by the profession at large, the natural trend is to accept the statement of manufacturers and to make few personal observations concerning the drug action. The writer is convinced that physicians are overlooking the most important field of medical study in neglecting the study of the exact action of drugs prepared from plants.

Sectarian physicians have been studying these and because of this fact, the regular profession has built, in the past, a wall of prejudice between themselves and this vitally important knowledge. No more interesting study can be undertaken than that of the plant drugs. Their action is uniform, invariable when once accurately determined and most reliable. If time would permit I should like very much to call attention to a number of remedies that possess most remarkable properties which are seldom mentioned in this journal, or in other journals of this class, but a knowledge of which, once acquired, would be considered by the reader as valuable as any therapeutic knowledge he possessed. If I have said anything that would direct attention to a more general study of a few of the leading plant drugs, or even to a more precise and exact knowledge of certain hitherto unknown specific influences of some old remedies, such as quinine, whose action is much broader than that of a simple antimalarial remedy, and can persuade physicians that their field of knowledge would be broadened by such study, and that their influence should be used to arouse new interest in the study of therapeutics, I shall have accomplished the object of this paper.

IMPROVED YELLOW OXIDE OF MERCURY OINTMENT.

TALBOT R. CHAMBERS, M. D.
Ophthalmologist to Christ Hospital, etc.
Jersey City.

The Yellow Oxide Ointment has been and will continue to be a most universally employed medication the world over. It is recommended in all the works on diseases of the eye. It has always proved very efficient but had one great drawback, so serious that some individuals have preferred the disease to the pain experienced in the use of this salve.

The improved ointment is made as the United States Pharmacopœia directs, except that the precipitate is not allowed to dry before mixing with the grease. Thus dissolve 25 grammes of corrosive chloride in 250 grammes of warm distilled water. Dissolve 10 grammes of sodium hydrate in 250 grammes of cold distilled water. Slowly mix these two solutions and allow the resultant to stand for about an hour at a temperature of about 30° C., agitating frequently. Decant the supernatant liquid from the precipitate. Wash the precipitate with distilled water until free from soda.

The precipitate, a moist magma, is placed on a cloth strainer and allow to drain. Before it has dried it is incorporated with equal parts anhydrous wool fat. This in turn is mixed with two parts white vaseline.

If our druggists will keep this stock ointment on hand, of which four grains roughly represents one grain of yellow oxide of mercury, they may in a minute prepare any strength of ointment desired and the result will be constant—a smooth, uniform, elegant and effective ointment, which has the added virtue of being painless. By the old method of simply mixing the dried oxide with vaselin, it takes prolonged rubbing to obtain a smooth result which, after all, under a low power shows its granular condition. Theoretically, the ointment freed of its granular condition should be less painful than where the granules are present. Practically, I am able to record that individuals who found the old formula too painful register no objection to the improved style.

A SYMPOSIUM

THE EFFECTS OF ATHLETICS ON YOUNG MEN.

Surgeon General Charles F. Stokes, U. S. N., had little thought, when he prepared his report on the health of the navy for 1911, that his remarks on the effect of athletics upon the officers of the service would arouse so much interest. The report as published in the February issue of the MEDICAL TIMES and discussed therein by surgeons and many of the best qualified medical athletic experts in the country, has been considered by other professional journals, and the metropolitan and the college press has treated the symposium editorially at greath length. The consensus of opinion seems to be that college athletic activity is a prime necessity that should be governed as carefully as are collegiate intellectual pursuits.

The contributors to the second part of the symposium include some of our best known college medical directors. They are men of mature years and physicians of wide knowledge, and one has but to examine athletic conditions at the institutions they so admirably serve to realize that their words are weighted with the truth of experience.

It is our hope that the presentation of the real facts anent athletic conditions in our universities and colleges will result in such changes as to be of the greatest benefit to the entire body of American college students.

CURE FOR ATHLETIC ILLS LIES IN CLOSER CONNECTION BETWEEN ORGANIZATION AND DIRECTOR OF ATHLETICS.*

JOHN W. BOWLER, M. D.,
Professor of Physical Education and Hygiene and Director of the Gymnasium in Dartmouth College.
Hanover, N. H.

Every athlete and athletic director must have felt a keen interest in the report of Surgeon General Stokes, which was reviewed in the February issue of the MEDICAL TIMES, and which has given rise to the present symposium. The TIMES may properly ask from all who are charged with the athletic interests of our colleges, how far we agree with Dr. Stokes's conclusions, and in what way we propose to remedy whatever evils may be admitted to exist.

It is impossible within the limits of this article to canvass all the considerations suggested by the Surgeon General's report, or indeed to treat exhaustively of any such considerations. The features of the case which I will lay stress upon are chosen because I believe them to be most fundamental and least generally recognized in current discussions of the subject.

It may conduce to clearness and help to define possible issues if I begin by a series of propositions, which I shall then attempt to defend and establish, or, if this be too ambitious a task, at least to illustrate and make probable.

1. Athletics, properly directed, including athletic contests, are unqualifiedly beneficial.

2. The "case against athletics," when sifted, resolves itself into a case against the way in which the athletic activities are taught, organized, and directed.

3. The method of choosing, retaining, and controlling athletic direction in our colleges is the real menace to the health of the college athlete.

4. The present system of organization and direction frequently has in it greater danger of harm than hope of good.

5. If it were possible to secure evidence of the character and results of the mental training of our colleges, we should find that dangers and evils exist, similar in kind to those of college athletics, though they are undoubtedly much less in degree.

It is my firm conviction that there is no real dispute among qualified experts regarding the first proposition, when it is properly understood. Certainly it is unnecessary for me to remind such persons of the direct and indirect tonic and developmental effect of athletic activity upon every sort of human tissue. Nor should it be necessary to dilate upon the direct and indirect influence of such activity in developing those qualities and habits which in their aggregate constitute character. So certain am I that this first proposition is not really in dispute that I hope to receive universal assent as to its validity if I can trace to its source the confusion from which has resulted the apparent disagreement.

2. When, then, we analyze the situation, in the attempt to trace out the origin of the current confusion in this matter,—in other words, when we sift the "case against athletics" we find that it resolves itself into a case, not at all against athletics as such, but against the way in which athletics are taught, organized, and directed.

In spite of a multitude of differences of detail among our colleges in the administration of the athletic branch of their activities, it is possible to select certain broad, outstanding features,—and these the really significant ones,—which are almost universal in the situation as it stands to-day.

For historical reasons, into which we need not enter, the athletics of our colleges are nearly everywhere controlled, really if not nominally, by the undergraduates and the alumni of from one to fifteen years' standing. A few colleges are still in the earliest stage of development, in which control rests entirely in the undergraduate body. A somewhat greater number of colleges have already entered into the latest phase of development, in which the faculties exercise a nominal,—in same cases even a real,—joint control with undergraduates and alumni. This bare allusion to the historical development of the administration of college athletics suggests the interesting reflection that we are tending toward a final step in which those activities will be treated as in all respects a regular department of the college curriculum, for which trustees and faculties will feel the same sort and degree of responsibility that they now admit in the case of the regular curriculum.

The general absence of real faculty control, whatever may be its incidental advantages, is the source of most of the difficulties and dangers of the present situation. Jealousy, proper and improper, results in frequent conflict, injurious alike to the athletic and intellectual interests of the college. How this central fault of organization,—or disorganization,—produces its results will appear in the following closer analysis.

The trustees and presidents of our colleges (with the advice and consent of the faculties) choose the new members of the regular teaching staff. The salaries, expenses of equipment of buildings, libraries, laboratories, etc., are paid from the regular college funds. An elaborate faculty organization of committees is maintained to coördinate the work of the various departments of study, to act as a clearing house for information regarding the capacities and needs of individual students, and to supervise the examination system.

3. When we turn from the organization of the traditional work of the college to the mode of choosing, retaining, and controlling the athletic direction, the contrast is ominous.

College trainers and coaches are regularly chosen by "young alumni" and undergraduates, to whom in turn they must look for their pay. The basis of selection is the assumed ability of the candidates to "make good, i. e., to turn out winning

*Dr. Bowler has been concerned with athletics, as amateur and professional athlete, trainer and director, and later as medical adviser to athletes, for a period of nearly thirty-three years, and is largely responsible for Dartmouth's remarkable strides in every form of athletic activity. —ED.

performers or winning teams. In estimating the probable ability of the candidate to "make good," the first test applied is quite properly the "historical" one. Has the candidate in his earlier and narrower field of action,—in his earlier experiments, turned out winners. The increase of interest in athletics has been so recent and so rapid that the demand for trainers and coaches must in part be satisfied by resort to another source of supply, which is afforded by those who, though without experience in training or coaching, have themselves "made good" as "point winners" in contests of field or track or as "star performers" on winning college teams.

What precisely does this mean? It means, first and most significantly that no thought is given to the question whether the candidate for the place knows anything about the anatomy or physiology of the human body. Little if any heed is given to the probably personal influence of the man upon his charges. He is not asked to give an opinion upon the personal and possible benefits of physical development. It matters not whether he has given attention to the science and art of training. Now medical practice undoubtedly owes much to empiricism,—even isolated, individual empiricism. It has gained even more from the empiricism of those who have fallen back upon the empirics of their colleagues and predecessors. But physicians, however grateful they may feel for the tested results of experimental practice, will not deny that empiricism in medicine would show a high percentage of fatally mistaken "experiments." Why should we express surprise if "empirics" score in athletic coaching or training frequent failures along with startling success in their practice? Why seriously argue the question whether "present day athletic sports have a deleterious effect upon the participants in after life"?

The basis of selection of the coach or trainer is also the basis of his retention. He does not need to be told that he must turn out winners if he would hold his place. He sees it in the faces of his employers when his charges fail to win. He hears it in muttered or open expressions of discontent. Defeat must have its explanation and its victim,—and both can be found in the "outsider."

My whole life has been passed in this "game." Now, in middle life, as I look back upon my own work and that of my acquaintances and friends, as I consider our task from the wider outlook afforded by increasing years and by the science of the schools, I stand in wonder that I can recall so few cases of "deleterious effects" resulting from my own malpractice and that of my colleagues! It is a testimony to the natural good in man and to the possibilities even of empiricism, that we have been so far able,—are so far able,—to disregard the sting of the economic lash in the performance of our unappreciated work; and that our blundering and blind search for the right methods has apparently wrought so little ill.

Permit me to review the foregoing analysis. Control rests with the undergraduates, whose perspective is limited to the four years of their "generation," and by enthusiastic and loyal alumni, chiefly young men whose loyalty does not forbid, if it does not invite, "backing" the college by backing the "team,"—to win. Winning seems most likely under the direction of those skilled in winning, through themselves or others. Such specialists in "winning" can rarely be more than empirics in their handling of the human body. The self-interest of the coach, directed to turning out winners, is bound at times to conflict with the other more rational aim of harmonious, permanently beneficial physical development,—even if such an aim be present in the mind of the trainer or coach.

If this analysis be accepted as essentially just,—and I do not believe that it will or can be successfully attacked,—have I not established my third proposition?

I hasten to add one qualification. In a small, but increasing number of colleges, general supervisory power in athletics has been entrusted to a director, at least nominally chosen and paid by the Board of Trustees, and enrolled with the regular faculty of the College. In such cases it may be within his power and duty to secure harmony among rival athletic interests; to aid in securing harmony between the rival demands of the college upon the minds and bodies of the students; and, finally, to secure harmony between the quite legitimate and meritorious desire to win and the equally legitimate and meritorious desire of trustees, instructors, and parents that no student should be sacrificed to the god success.

It is gratifying to be able to record here the fact that some colleges have gone so far to destroy the "case against athletics." Candor compels the admission, however, that in some colleges the athletic director is not aptly or happily named. Even a director may find himself sharply limited when the strict performance of his duty would hamper or seem to hamper the coach's chance to have or make a winning team. In only a very few American colleges has this issue been squarely faced and settled in favor of the plaintiff in the case of athletics *vs.*. victory.

4. If I have successfully established the earlier propositions, I am relieved from the necessity of demonstrating the further proposition that the present system of organization and direction frequently has in it greater danger of harm than hope of good. The vicious and dangerous features of the system as it exists even in our larger and better colleges become more vicious and more dangerous as we descend the scale. The desire to win is, if anything more intense and increasing; student control more unqualified, the coach's pay more meager and precarious.

5. Comparisons may be "odorous" but they are mighty helpful as the father found whose son reporting himself head of his class, added he was also the whole class. It may help to give a sense of proportion in this discussion if we attempt at least a conjectural comparison of the beneficent and "deleterious effects" of athletics with those of mental training which our colleges afford. I have already indicated differences in the organization and direction of the rival suitors for the student's interest and attention, and have expressed the strong conviction that the cure for our "athletic ills" lies in the direction of a closer connection between the two activities. But in fairness to the good even in our present vicious system we ought to note certain respects in which athletics suffer unjustly and unduly by comparison. It has been said that the physician buries his mistakes. Does the regular college instructor ever do the same? Are there accidents of the mind comparable to those of the body, Does ill-directed, unbalanced physical development have its counterpart in one-sided, futile mental development? Against the occasional death of the body, which we must charge against a vicious system of athletics, can we place an occasional death of the soul, an unregarded classroom tragedy? I ask these questions in all seriousness, and believe that an equally serious reply would justify my claim as formulated in the last of the propositions which I have engaged to defend.

The invitation to engage in the symposium was like a "call to arms" to me. My difficulty,—as I fear may be only too obvious,—was not what to find to say but what might hope to be best worth while. It would have been a pleasure to draw upon personal experience for concrete illustrations of the points I have tried to establish and of others that I must omit even to mention. It would have been a welcome task to show in detail just what benefits I have known to result from athletic training. I should have liked to offer evidence for my opinion that even our vicious system of athletics is charged with a greater burden of sins of omission and commission than is just. If, as I hope and believe, the considerations herein presented are the critical ones which define the real issue; if, which it were perhaps vain to hope, what I have here written will help to clearer thinking and so some approach to general agreement, my choice is justified.

THE EFFECTS OF ATHLETICS IN AFTER LIFE.

GEORGE L. MEYLAN, A. M., M. D.,
Medical Director and Director of the Gymnasium, Columbia University.
New York.

The annual report of the Surgeon-General of the U. S. Navy for 1911 contains the following critcisms of athletics:

"The Bureau is of the opinion that competitive and spectacular athletics are undesirable in the service, especially among midshipmen who are prone to overstrain for, or hazard too much in, a contest. . . . The prolonged vigorous course of physical exercises necessary to excellence in physical sports is believed to be dangerous in its effects upon those who indulge in athletic sports sufficiently to excel therein. When, under the condition of service at sea, it becomes impossible to continue vigorous exercise, the individual easily falls prey to degenerative changes, tends to become obese, to lose physical stamina, and in the end he fails to render as many years of efficient service under service conditions as does his less athletic but symmetrically developed classmate. Recently the medical record of 625 former athletes of the classes of 1891 to 1911 have been examined to determine the bearing of overtraining upon physical efficiency in after life—9 have died and 12 have retired. . . . Of the remaining 604 in the service, 198 have disabilities or abnormal conditions of sufficient moment to be of official record, and to which their records as athletes bear a possible or probable causative relation, and while in most instances not physically incapacitating the individual, tend toward an imminent or premature loss of service. The opinion that long distance crew or foot racing is not beneficial, but productive of serious harm, is not held alone by the naval medical officer, but by those in civil life best qualified to judge, and it is believed that it needs but a decided stand on the part of an institution of the standing of Annapolis for the adoption of a "safe and sane" standard in these and other endurance contests to initiate a similar movement in the athletic world, making success dependent more upon skill and less upon brute force."

This report has already aroused much discussion all over the country. The question at issue is a vital one, as it involves the welfare of the present and future generations of the nation's most promising young men. The editorials and articles called forth by the Surgeon General's condemnation of competitive athletics indicate that the statistics offered were accepted as furnishing conclusive proof that former athletes of the Naval Academy have a higher mortality, a larger percentage of morbidity, and a shorter period of efficient service than their less athletic classmates. Unfortunately, the Surgeon General's contribution is entirely devoid of any facts, statistics or proofs to support his opinion.

It seems apparent that these necessary comparative statistics have not been tabulated, for otherwise they would be included in the report. Therefore, we may assume that the Surgeon General's statements concerning the effects of athletics on naval officers are based on general impressions and not on observed facts.

Some of the statistics necessary for a comparative study of the former athletes with the midshipmen at Annapolis are available in various parts of the Surgeon General's report for 1911. Inasmuch as the midshipmen at the Naval Academy are on the average only about 20 years old and that they are living under conditions and an environment most favorable for health and low mortality, they should compare very favorably in mortality with the 625 former athletes referred to in the report under consideration.

These athletes belonged to the classes from 1891 to 1911; therefore, about half graduated more than ten years ago, have had from ten to twenty years service, and are between 30 and 40 years old; the other half have had from a few months to ten years service and are between 20 and 30 years old. These 625 former athletes are therefore naval officers averaging about 30 years of age, and they have had an average of about ten years service in the navy under conditions and in an environment undoubtedly less favorable for health and low mortality than the conditions of life and the environment of the midshipmen at Annapolis.

The mortality of the 625 athletes during a period of 20 years 1891-1911, is 9, or 14.4 per 1,000. The mortality among the 706 midshipmen during the year 1910 was 3, or 3.95 per 1,000 (page 91). Now, if we assume that the 625 athletes were distributed about equally during the twenty years from 1891 to 1911, the average number of years for which the mortality is given would be ten years; therefore, the mortality for all midshipmen at the Naval Academy during a period of ten years would be 39.5 per 1,000, or nearly three times as much as the mortality among athletes.

According to the American experience table of mortality, 7.80 per 1,000 of young men 20 years old die annually. The mortality for midshipmen in 1910 was 3.95 per 1,000, or half of the usual rate for young men of that age.

According to the same table, the mortality of young men 30 years old is 8.43 per 1,000, whereas the mortality of the 625 athletes for a period of 20 years averaged only 1.44 per 1,000, or about one-sixth of the usual rate for age 30. Therefore, the naval athletes have a mortality only one-third that of all midshipmen at Annapolis and one-sixth that of life insurance risks.

The report states that twelve of the former athletes have retired—presumably they were invalided from service, although some may have retired for other causes than physical disability. Twelve out of 625 is 19 per 1,000 in a period of twenty years. In 1910 there were 10 midshipmen invalided out of 760, or 13.2 per 1,000 (page 91); therefore, the number invalided in ten years would be 100, or 132 per 1,000; about seven times as many as the average for the athletes.

Similar comparisons may be made in regard to some of the disabilities from which athletes in the service are suffering. The report states that 17 athletes out of 604 or 28 per 1,000, still in the service, are either frankly tuberculous or have had symptoms indicative of tuberculosis. The report shows that in 1910 one midshipman was admitted to the hospital at Annapolis (page 78) and 7 midshipmen were admitted at the Naval Sanatorium for Tuberculosis, Las Animas, Col. (page 80). That makes eight cases of tuberculosis in 1910 out of 760 midshipmen, or 10.5 per 1,000. Again, if we multiply this figure for a period of ten years, we have 105 per 1,000 for all midshipmen as compared to 28 per 1,000 for the athletes.

The figures for appendicitis are 25 cases, or 41 per 1,000 for the athletes, and 118 per 1,000 for all the midshipmen in 1910, or 118 per 1,000 for the period of ten years.

Mortality, Disability and Morbidity per 1,000 of Former Athletes and Midshipmen in a period of 10 years:

	625 Former Athletes.	Midshipmen (based on 760 Midshipmen, 1910).
Mortality	14.4	39.5
Invalided from service	19.	132.
Tuberculosis	28.	105.
Appendicitis	41.	118.

There are no figures in the report for comparisons of the other causes of disability, but the above table shows that the former athletes suffer much less from tuberculosis and appendicitis and have a much lower mortality rate than the less athletic midshipmen. It is most likely that if comparative figures for diseases of the heart and kidneys, neurasthenia and hernia could be obtained, they would show the same advantage in favor of the athletes.

Such a result is not in the least surprising for it confirms all previously published results on this subject. Dr. William Morgan in his book, "University Oars," published in 1873, shows that the 294 Oxford and Cambridge oarsmen who rowed between 1829 and 1869 were healthier and longer lived than the accepted risks of life insurance companies.

Dr. W. G. Anderson found that the graduates of Yale who had won their Y on 'Varsity athletic teams while at college, had a mortality considerably less than that of all other graduates.

The writer, in "A Study of the Effect of Rowing on Harvard Oarsmen" (*Harvard Graduates' Magazine*, March and June, 1904), showed that Harvard oarsmen have a lower mortality than that given in the American Life Insurance tables; also, that 64% enjoyed "excellent health" and 34% "good health" during the ten to fifty years that had elapsed since they graduated from college.

When we consider that the midshipmen who make up the personnel of the varsity athletic teams represent the strongest and most vigorous individuals of the corps, which is itself a body of young men selected very largely on the basis of health, vigor and freedom from physical defects, we should expect these athletes to enjoy better health and longer life than other groups which have been studied. It is therefore impossible to know definitively the exact effect of competitive athletics on the midshipmen in after life, but the statistics that we have are so positively favorable to the athletes that there is no justification whatever for the assumption that athletic competition at the Naval Academy is detrimental to the future health and longevity of the participants. But, this happy result should not lead us to overlook two real dangers which exist in intercollegiate athletics to-day. The first, is the risk of serious injury to health that some athletes are subjected to in institutions which do not provide adequate medical and faculty supervision over athletic teams. The inordinate desire to win at any cost, accompanied frequently by betting, will inevitably lead to excesses and occasional physical injury to participants. Such injuries usually result from allowing athletes to compete when unduly tired, partly disabled or otherwise unfit for athletic competition. The remedy for this condition is to properly supervise athletics, not to abolish them.

The second danger has to do with the danger of physical deterioration after graduation. The young man who takes a prominent part in athletics while in college finds more difficulty in adjusting himself to sedentary life after graduation than does his less athletic classmate. The Harvard oarsmen examined by the writer had experienced more or less difficulty in adjusting themselves to sedentary pursuits after graduation. This difficulty can be overcome; all that is necessary is for the athletes to keep up some form of exercise after graduation. The opportunities for vigorous exercise are probably less under conditions of service at sea than on land, but they can be found. Furthermore, the habit of exercise and the discipline of training constitute important factors in the education of the individual for the life after graduation. Self-control, appreciation of the value of simple and clean life, and regular exercise are among the chief results of sane and judicious athletic training.

THE EFFECTS OF ATHLETICS ON PARTICIPANTS.

RAYMOND G. CLAPP, M. D.,
Professor of Physical Education and Director of Athletics, the University of Nebraska.
Lincoln, Neb.

My experience of nearly twenty years with competitive athletics fails to corroborate the Surgeon-General's conclusions that competitive athletics, as conducted in the Colleges and Universities of the United States, are harmful to any considerable percentage of the participants. No one who is familiar with this important subject will contend that serious injuries, either immediate or remote, do not occur in exceptional cases. In the opinion of the writer, however, nearly all of these cases that are fairly attributable to athletics can be traced to one or more of the following causes: too little preliminary training or the opposite condition, i. e., excessive overtraining, a lack of proper medical supervision, the exaggerated importance placed on victory, or a considerable number of similar causes—all of which may be eliminated, and *are* being gradually eliminated in those institutions where proper supervision is enforced.

Probably the most important etiological factor in cases of remote physical breakdown and premature death among college athletes is the sudden cessation of all physical activities and close devotion to sedentary occupations immediately after graduation. It is manifestly unfair to attribute these untoward results to athletics. They should be charged either to ignorance of the possible danger on the part of the individual or to a lack of common sense. It is often said, too, that strenuous athletic competition produces a muscular development and heart and lung power that are useless and dangerous for ordinary life. This is undoubtedly true if the individual suddenly changes to a life of physical inactivity. I believe that this hypertrophy of the muscular system and vital organs is entirely natural and that it is accompanied by ability to perform superior mental as well as physical work—particularly the ability to work under high pressure, which is a necessary qualification for success in all lines of business and in the professions. Sudden changes to physical inactivity, as well as strenuous physical work following long periods of rest, may result disastrously and in the former case degeneration of the hypertrophied tissues is bound to follow. This degeneration may, or may not, be such as to produce serious consequences. Regular systematic exercise adapted to the particular individual and modified to meet the advancing periods of life should make possible the retention of this increased vitality produced by athletic exercise and should tend toward longevity rather than premature debility or death. In other words, the most common ill-effects of athletic competition may be avoided and the benefits of the work retained for valuable future service to the individual by proper methods of living. After leaving college the athlete may find difficulty in securing facilities equal to those provided by his alma mater for continuing physical exercise, but certainly all necessary facilities of one kind or another will be available in almost every case and any one who will limit himself to reasonable hours of daily work and who will use a part of his leisure time in this way will, in my opinion, be able to perform all exercise necessary to the maintenance of his health—even in the narrow confines of a man-of-war.

Failure of athletes to continue moderate physical activities after graduation is in reality nothing more or less than the exaggerated reflection of our national temperament and due to a lack of interest in modern exercise devoid of the artificial excitement of keen competition and the applause of the spectators.

This spirit of Americanism, as shown in athletic training in our colleges, has, however, its merits as well as demerits. The student makes a business of his competition for a place on the team; he puts his whole heart and soul into it; no sacrifice is too great for him to make. As a result he develops a spirit of thoroughness and "stick-to-it-iveness" that is of inestimable value to him in after-life when he is confronted with some perplexing problem, civic, business or professional. He has learned to despise a "quitter" and will see the problem solved regardless of the effort necessary to accomplish it. I would not exchange this training which I obtained on the Yale Field for my best course in college (and this is not written disparagingly of the thorough and valuable instruction which I received in the Sheffield Science School). These factors in character building are often overlooked in considering the merits of competitive athletics, but I believe that they are of sufficient value to more than counterbalance many of the possible physical injuries.

The more strenuous sports—such as football, rowing, basketball, long distance running, etc., consist of two distinct parts—so far as the effect on the contestant is concerned. One is the physical training in preparation for the contests; the other is the competition itself. In preliminary training, as generally conducted, there is not sufficient tendency toward overwork as to make this an excessive strain on the system and the

result is almost universally beneficial—barring, of course, such accidents as may result from violent personal contact in football, basketball, etc. On the other hand the exaggerated importance placed on winning contests causes an abnormal nervous excitement and overwork which is often carried to the point of severe exhaustion. This puts such a strain on the vital resources of the individual that the result must be temporarily detrimental—and in exceptional cases—particularly among those physically unfit to take part in such strenuous activities—the result may be permanent injury. These two effects are, of course, diametrically opposite. In my opinion the net resultant of these two forces diametrically opposed—so far as their effect on the system is concerned—is decidedly beneficial to the individual. Undoubtedly greater physical benefits would result if we could eliminate the competition itself. However, without the pleasures and applause derived from the competition the large majority of our students would refuse to continue the more moderate exercise of the training period. The solution of this particular phase of the problem lies in the education of the student body and the general public to see the necessity of minimizing the importance of victory and emphasizing sport for sport's sake. This is being accomplished to a considerable extent, in a number of our colleges, by the encouragement given to intra-mural athletics. This furnishes exercise for a very much larger number of students and divides the athletic interest among many contestants in a number of different sports instead of centering it on the few members of a "varsity" team. By these means, the tendency to overdo is greatly lessened and we correct also one of the most reasonable criticisms that can be made against college athletics, namely—that we have been conducting athletics for the benefit of a few physically superior men instead of the rank and file of the students who need it most.

I think there is serious question as to the wisdom of allowing boys of high and preparatory school age to take part in rowing, long distance running or basketball contests under the present rules—if the competition is keen. This is also the period in an athlete's life when the *need* for medical supervision is *greatest* and we find it to be the one where the *least* is provided.

Our athletics are by no means conducted ideally at the present time, but I believe the general effect to be decidedly beneficial; furthermore, those in charge of this important branch of college activity are keenly alive to the real evils and needs, and conditions are gradually improving year by year.

The more important beneficial effects, injurious effects and remedies for the same may be summed up as follows:

Beneficial effects:

(a) Bettter general health.
(b) Increased ability to perform muscular work.
(c) Increased ability to perform mental work.
(d) Character development.

Injurious effects (part of these are not fairly traceable to athletics).

(a) Immediate and temporary physical injury.
(b) Permanent and remote physical injury.
(c) Applause of fellow students apt to give athlete an exaggerated idea of his importance in relation to his fellows.

Remedies:

(a) Careful medical examination before participation in strenuous physical activities is allowed.
(b) Careful medical supervision to prevent under-trained or over-trained students—or those otherwise unfit—from taking part in competition.
(c) Education of athletes to understand the necessity of continuing some form of physical activity after graduation.
(d) Development of intra-mural athletics in order to minimize the tendency to overwork.

X-ray examination is taking the place of laparotomy as a means of diagnosis in diseases of the stomach. It is of little assistance, however, in duodenal ulcer.

THE AFTER EFFECTS OF ATHLETICS.

JAMES NAISMITH, M. D.,
Medical Director of the University of Kansas.
Lawrence, Kan.

When we consider the extreme delicacy of the human frame, its fine adjustment to the purpose for which it was created, the unending work of some of the organs, the inability of certain muscles to stop and rest, we may well ask ourselves if it is possible for the body to stand the strain put upon it in some of our athletic contests. But our wonder at the possibility of its endurance does not answer the question nor are we justified in jumping at the conclusion that athletics are injurious. Nor does the record of the deaths of athletes since participation prove that athletics induced the mortality. When we find men far past the half century mark hale and hearty and able to hold their own with the younger men, men who have participated in the most vigorous contests and in athletics have given the last ounce of their energy, looking back years afterward on their lives and making the assertion that athletics have made them, we may look well before we condemn athletics.

It is hardly fair to saddle on athletics many of the abuses that, while not a necessary part of athletics, are all too frequently associated with them as well as with most other events which bring men before the public. These men who have engaged in athletics to the extreme and are still hale and hearty will be found to have avoided many of the excesses which, as every physician recognizes, especially induce diseases of the heart and blood vessels.

When a father has developed a strong and hardy physique by strenuous work and athletics, is it fair for him to coddle his son even though he may fear that the work is too strenuous. My own feelings have been that the strain on the heart in rowing, Marathon and even shorter races was too much for the human organism, but when we consider the finding of Morgan among the English oarsmen, Meylan among the American, and the work of Watson L. Savage in the Marathon race at Pittsburg, our feelings must give place to the investigations of the facts.

In a questionaire sent to all the men who had played on the football teams of the University of Kansas prior to the year 1907, among other questions three were asked which may throw some light on the attitude of the living to the effects of the game on the constitution and the individual.

In answering the questions no notice was taken of the small cuts and bruises that go with almost every game of football. Not all the men answered, but those who did were of the fairly representative type of player and fairly representative of the football players of the period covered. While the findings are not conclusive, yet they show that these men when they had been out of college long enough to be free from the glamor of the contest and have settled down into the work of the world, look back upon the strenuous exertions of athletics as being highly beneficial. And while the answers have been abbreviated in this article yet the feelings of the individual were strongly expressed in many of the answers. It may be that the fact that Kansas is a prohibition state modifies the effect of the strenuous exercises.

These do not represent all the injuries received by all the men of that time, but they were the ones that impressed the player at the time and could be recalled. Would we be justified in eliminating the strenuous from college athletics where the participants are mostly mature and under supervision. In the final games played by the University of Kansas this year there was time taken out for a Kansas player only three times, and in two of these games time was taken out but once for injury to a player of either team.

To the question, "What injuries did you receive while playing football?" the answers were as follows:

None	40	Fibula broken	3
Knee sprained	7	Clavical broken	2
Ankle sprained	7	Concussion	2
Nose broken	5	Hip sprained	1
Shoulder sprained	4	Back injured	1
Bruised thigh	9	Neck injured	1
Rib broken	3		

To the question as to what was the recovery from these injuries the answers were *good*, except:

Still feel some slight effects	3
Not completely recovered	3

Of the three who felt slight results two of them were from bruised muscles in the thigh (Charley horse). The third was an injury to a muscle in the arm which necessitated the removal of the muscle. Of the three that were not completely recovered one was an injury to the neck and two of them were sprained knees.

To the question, "What benefits did you derive from the game?" the answers were:

Physical development	40
Self control	27
Rapid judgment	20
Wider acquaintanceship	15
Ability to react quickly	11
Determination	11
Courage	8
Mental development	8
Elimination of the effects of tobacco, etc.	7
Moral stamina	6
A better ideal of sportmanship	6
Speed	5
Self reliance	4

Others were mentioned by one to three.

THE AFTER EFFECTS OF COMPETITIVE ATHLETICS.

JOSEPH E. RAYCROFT, M. D.

Professor of Hygiene and Physical Education in Princeton University; late Medical Director (1899-1911) University of Chicago and Associate Professor of Hygiene and Physical Education (1903-1911), School of Education, University of Chicago; late Instructor in Diseases of the Chest, Nose and Throat, Rush Medical College.

Princeton, N. J.

Few of the many considerations connected with competitive athletics are more important than the question of the after effects on the competitor. Many statements based upon opinion, rather than experience or investigation, have been made on both sides of this question: "Are many of those who have taken part in modern competitive athletics, particularly football, handicapped by serious and permanent after-effects so that they are unable to attain their full possibilities of usefulness in later life?"

A recent report by the Surgeon-General of the United States Navy touches upon this subject and concludes that such competition does have definite, deleterious effects on the competitor in after life. In this conclusion, it is at variance with two other thorough and reliable reports. The Study of the After Effects of Football,[1] in which the testimony of the great majority of men that had played on Harvard, Yale and Princeton teams was to the effect that bad physical results followed their participation in these games in very few instances, while the other results were invaluable. The other investigation[2] dealt with the physical after effects of rowing upon the men who had represented Harvard for a period of over forty years. It is generally conceded that no other sport makes such exacting demands on a young man as crew racing; but here, as in the first investigation cited, the record, based upon personal testimony of the men themselves, and careful medical examinations, justified the conclusions that bad after effects resulted in only a very small proportion of cases.

1. Football Facts and Figures. Compiled by Walter Camp. Published by Harper Bros. in 1894.

2. Harvard University Oarsmen—1852 to 1892, by George L. Meylan, M. D. Published in the Physical Education Review, May and June, 1904.

It is to be noted that both of these studies were made of men who had competed at a time when medical supervision was much less general and efficient than it has been during the past few years.

The Surgeon-General of the Navy in his report calls attention to the fact that out of 625 naval officers, from 20 classes, who had been athletes in the Academy, 21, or 3.3% have died or have become unable to continue active duty because of physical disability; and that 198, or 32+%, have suffered disabilities or abnormal conditions of sufficient moment to be of official record.

An examination of the record shows that of these 198 cases 48, or 7.7% of the whole number, are referable to heart or blood vessels; 11, or 1.7+% to kidneys; 25, or 4% to appendicitis; 17, or 2.7% to tuberculosis; 15, or 2.4% to hernia; and 16, or 2.5% each to joint disabilities and neurasthenia.

That is, 23.5% of the 625 athletes in active service for twenty years or less have, at some time during that period, come on the official record as suffering from some one of the above disabilities; and this condition is considered to be due to the effects of athletics. In the light of the results of the two investigations cited it would appear that the conditions under which naval officers work must be unusually trying physically.

A careful study of this report suggests two questions:

1. What is the official record of physical disability among the other men who graduated from the Naval Academy during the same period and who have been living and working under the same general conditions as those noted in the investigation?

2. To what extent, if any, may these disabilities be explained by venereal infectons,[3] the use of alcohol and tobacco, and the lack of opportunity for, or failure to take regular systematic physical exercise[4]?

The writer has been intimately associated with school and university athletics for more than twenty years in various relationships as player and coach, and during the last twelve years as physician in medical charge of all the teams at the University of Chicago. The number of injuries from which there have been serious results, either immediate or remote, has been so small during this period as to be practically negligible. Since the men, who take part in competitive athletics, are for the most part selected from those already physically capable, the physical values may be regarded as relatively incidental. On the other hand the development of self-control, initiative, and ability to exert one's powers have been so great and so beneficial a factor in their general development that there seems to me to be no question that adolescents and young men should be encouraged to take part in competitive sports when they are conducted under adequate medical supervision.

3. The rate of admission to the hospital from the academy for primary venereal infection is 70 per 1000. Table 6, page 45, Report for 1911.

4. The surgeon-general recommends that the present requirement for physical exercise for officers be modified so as to ensure that officers will be kept constantly in good physical condition. Page 90, Report for 1911.

The Family Phyiscian and Epilepsy.

The physician institutes discipline and supervision at home which will be of benefit to patient and family, remarks Munson in *L. I. Med. Jour.* He can encourage the patient to work. He can assist in the eugenics movement by creating in his community a sentiment in favor of restricting marriage on the grounds of mental and physical fitness and by collecting data. By assisting in the limiting of the spread of infectious diseases and especially of the venereal diseases (and alcohol) through education or otherwise, he can assist in limiting the amount of degeneracy.

ATHLETES DO NOT DIE PREMATURELY FROM CARDIAC DISEASES.

R. TAIT MCKENZIE, B. A., M. D.
Professor of Physical Education and Physical Therapy in the University of Pennsylvania.
Philadelphia, Pa.

After reading with care Surgeon-General Stokes' report relating to athletics one could wish that certain additional figures had been included in it to give an opportunity for comparison with those there shown. For example, do the obesity and degeneracy of advancing years leave untouched men in the Navy who have not been athletic as students? On what basis were the 525 former athletes chosen?

There is a physiological difference between the training of the casual and the habitual athlete, between that of the high jumper and the oarsman, the pole vaulter and the football player or distance runner. Are the 21 "casualties" out of 625 athletes greater than those among others? The implication left by quoting the one series of figures only is that there were none among the non-athletes. Is six out of 625 greater than the average rate of tuberculosis ? Of eight casualties due to nervous or mental diseases how many died, or how many deaths from both causes occurred; six and eight make 14 and there were but nine deaths altogether. Surely three suicides and two cases of alcoholism cannot have a very intimate relation to athletic activity in youth.

In the 604 remaining in the service, 198 are spoken of as having disabilities or abnormal conditions of sufficient moment to be recorded, 48 being referable to the circulatory system, among which are noted irregular or rapid heart action, hypertrophy or dilated hearts, and heart murmurs.

How would the proportion of 48 out of 604 Navy men who show some recordable abnormality compare with the proportion among non-athletes?

This fall in the routine examination of the incoming class at the University of Pennsylvania, covering about 1,500 men, 266 supposedly normal young men were scrutinized with unusual care by three observers in the lying, sitting, and standing positions, and after exercise. No men showing marked heart lesions were included. Heart murmurs were found in 74, or 28 per cent, but these men were not athletes, merely average healthy young men, and this proportion would probably increase with age.

No conclusions of value can be drawn without tabulating these and other facts for comparison. Fortunately this has been done in other instances and we can refer to Morgan's "University Oars," which shows an increased life expectancy among old Oxford and Cambridge blues. Meylan's report on Harvard oarsmen, the most thorough and conclusive investigation hitherto completed, Anderson's comprehensive report on mortality among Yale students, an extract of which is published in the February number of the MEDICAL TIMES, Hammett's valuable statistics on distance runners, and Savage's exhaustive research on the Marathon race. The figures of these observers speak for themselves and the one point on which they all agree is that athletes do not die prematurely of heart disease.

Out of more than ten thousand athletes whom I have personally examined and re-examined during the last eighteen years, I have fortunately never seen a death from acute dilatation nor have I ever seen a heart originally sound fail to recover rapidly from muscular strain after severe exercise, and I concur in Sir Clifford Albutt's belief that the young athlete is incapable by voluntary effort of permanently damaging a sound heart. He will fall exhausted or will give up the contest long before the danger limit is reached.

That there are accidents and injuries in football goes without saying. The reent changes in the rules have eliminated the most serious one, that of concussion of the brain from the impact of a man driven head foremost into the line by force and weight over which he had no control. The broken collar bone or sprained ankle rapidly recovers especially in men in athletic condition. The displaced cartilage of the knee is more serious in that it leaves the joint unreliable, and forms a real disability.

It is probable that a man in prime athletic condition carries less than his normal store of fat and so will resist the infection of pneumonia or typhoid less easily than his more inactive companion. Figures are not available on this point.

The whole question of athleties cannot, however, be confined to the compilation of the statistics of injury. The football is the only field we have in the absence of actual fighting, for that training in presence of mind, audacity, courage, endurance of pain and fatigue, pluck and "sand" that must characterize the youth of a nation which must play a leading part in the work of the world. Safety and sanity can be bought at too high a price. Nelson did not do the safe or the sane thing when he refused to retreat at Copenhagan or when he took his small fleet into the uncharted Bay of Aboukir; and while we must strive to abate abuses and dangers, we should not lose sight of what athletics contribute both physically and morally to the education of our youth.

THE NAVAL ATHLETIC SYSTEM AT FAULT.

NATHAN P. STAUFFER, M. D., D. D. S.
Instructor in the University of Mississippi Medical School; Professor of Hygiene in Dickinson College, 1896-1899; Head Coach University of Pennsylvania Baseball Team, 1903; Member Executive Committee National Collegiate Association; Member International Olympic Athletic Committee; Laryngologist and Otologist to the Presbyterian Hospital Dispensary
PHILADELPHIA, PA.

The Surgeon General of the Navy would have us believe that athletics are injurious and so they may be as indulged in by the Navy men. May it not be the fault of the naval system by which students work and drill from sunrise till sunset, so that their work is never done? Before I accept this report upon athletics as of scientific value I would like to know the family histories of the athletes in question. I would also like to know the exact number of hours they spent at football. Upon my visits to the Military and Naval Academies the officers always tried to impress me with the few hours their players were allowed to spend at football and I have been told many times that they practiced usually 45 minutes daily in October and sometimes only an hour and a quarter in November. Surely one could not place the blame of a dilated heart on football with so few hours as this spent in practice. It is unjust to any sport which only occupies at best one-twenty-fourth of the day to lay at its door all the dilated hearts and diseased organs.

Does the Surgeon General's report not show that the officers of our navy should have a better and longer graded instruction course, and not so much drill, that when sent out from the Academy they should have regular exercise as in student days and not be confined on shipboard so long and continously.

It is argued that football or other sports have a tendency to produce weak hearts in players and that football players are more liable to diseases of other forms than men who exercise moderately. I showed in a recent magazine article that in 1895, on the football team of the University of Pennsylvania, my last year in college, there were Bull, Whorton, Woodruff, Farrar, Off, Wagonhurst, Dickson, Boyle, Hedges, Williams, Brook, Minds, and Gelbert. All these men are alive and perfect specimens of manhood, and to the best of my knowledge, have never had a serious injury during their football career or since. In fact, I do not know of any healthier men.

My experience of over sixteen years, examining the hearts of athletes, has led me to the opposite conclusion: that football players are less prone to contract disease than men who do not play it. It is urged that a course of exercise will cause undue enlargement of the heart, which, it is intimated, will

remain permanently as a factor in predisposing to diseases. I would draw attention to anyone who would exercise four weeks at a time to develop their biceps muscle; how it will enlarge under constant use and then how it will just as surely *diminish* under nonuse. There seems to be a law of supply and demand in the human body, that as one uses certain organs they grow and when not used they become smaller. The right arm is larger than the left; the right foot is larger than its mate. I believe the heart and all the muscles follow this same rule.

All my medical and athletic experiences are against the findings of the Surgeon General and I would prefer to take my chances with the athletes. I believe the fault of our average American life is not too much exercise but too little.

PROPER ATHLETIC TRAINING A POSITIVE BENEFIT.

WATSON L. SAVAGE, M. D.
Director Physical Training Department, Pittsburgh Athletic Association.
Pittsburgh, Pa.

It is assumed that my invitation to take part in this discussion is due to the fact that it has been my privilege for upward of twenty years to examine and record the physical conditions of several thousand men, college boys, youths, women and children, varying in age from ten to seventy-five years—not less than a thousand in any group.

I am at present the examining physician of a club of thirty-five hundred adults whose average age is forty-one years, and for many years back I have devoted most of my time to bringing back into harness and keeping in harness the men and women who have made good, and in doing so have exceeded their capacity for work by reducing their productive possibilties and drawing on the principal to keep up the output, resulting in certain physical bankruptcy. In these examinations it has been my universal custom to get the history of the early physical activities and the degree of training through which they went at any period of their lives, as a necessary basis upon which to plan a course of treatment, and make a prognosis, my treatment, as you know, being exclusively hygiene of living and applied exercise.

Without going into a long investigation of records, it is only possible in this brief letter to express an opinion based upon strong convictions formed from these observations, summed up briefly as follows:

It is my belief that the greatest damage is done by severe training during the period of adolescence. I am so certain of this fact that I advise every parent, as far as possible, to prevent his boy or girl from participating in any form of competitive athletics during the period of rapid growth. I believe it both shortens their possible future greatness and also invites an earlier breakdown in after life. Note my classification, strenuous competition. This does not include many games of skill and team play which do not call for continued physical effort and high nervous tension. There is not space to go into the classification of games and contests further.

My second observation and impression recorded is that men and women break down earlier and more frequently who have never undergone a course of physical training in their younger days; or those who have had severe training stand hard work and business strains longer. The moderately trained show best.

Third, the prognosis for rapid recovery from physical breakdown is slightly better for the man who has never trained, best for moderately trained, and worst for the old time athlete. Finally, I am certain the benefit of athletics and competition in all forms of games far exceeds the injury, including football. The man who participates in active athletics and training has a better chance to stand the severe strains of life's struggles than the man who avoids them, and his chance for longer life and usefulness is considerably greater.

JOSEPH, BARON LISTER.

Born in Essex, April 5, 1827; died in London, February 11, 1912; B. A. University of London, 1847; M. D. University College, 1852; until 1860, assistant surgeon, Royal Infirmary, Edinburgh and 1869-1877; 1877-1893, Professor of Clinical Surgery, King's College, London; 1893-1912, Professor emeritus. Created a baronet in 1883; elected to the peerage as Baron Lister in 1897; president Royal Society 1895-1900; Surgeon to Queen Victoria and King Edward; recipient of honorary degree of M. D. from five foreign universities.

In considering Lord Lister's work, let us enter his life at the point of his *Croonian lecture*, delivered in London in 1863. The lecture was entitled Coagulation of the Blood, and disclosed the summit of years of research. He began with the simple narration of an incident. An arm had been injured, and hemorrhage proceeded until gangrene impended. The elementary method chosen by Lister was that of tying the brachial artery, and the part was saved. This story led to a consideration of the physiology of coagulation, and we are amazed to find so keen a knowledge, so exact a perception of so much which later years alone have been enabled to perfect. With one sentence he maims the error which taught us to ascribe coagulation to the presence and abstraction of the ammonia in the vascular fluid, and with another he entirely destroys its nominalistic progeny, that of naming a process as if it were a thing, (alas, for us with lipase, enterokinase, and other names for ontologized functions!) Lister showed that while the escape of ammonia might or might not occur, the question had to do with a radically different affair. The vital question took up its existence on the Hunterian principle of the admission or exclusion of air. This lecture was epochal. It recalls the manner of Lister's election to the fellowship of the Royal Academy in June, 1860, when against forty-seven, only seventeen were chosen, and of these Lister and Brown-Séquard were noteworthy. From 1853 on, Lister wrote paper after paper upon inflammatory conditions and changes in the blood therein, from which so much that puzzled surgeons and rendered nugatory their ablest efforts evolved. Yet he had not even up to the Croonian lecture formulated his method of operating. In his own account of that, we read his development of antisepsis from a note as to the purification of the town of Carlisle, by disinfection with phenol and irrigation over the broad acres adjacent. This he says gave him his light. We have read the item in the *Lancet* of 1860, p. 365, but Lister says that he first knew of this in 1863, and we may reason that he looked over the files after the publication of his Croonian lecture. Indeed, we will see that the *Lancet* gives space to a communication from Crace Calvert in 1863, p. 362, who suggests the identical procedure of Lister, and p. 464, there occurs a reply by J. Mill Fordsham, to the effect that in Germany this was already employed, and that creosote was used as a local disinfectant in surgery. Angus Smith and Dr. Letheby asserted in 1860 that the problem of sewage disposal was solved, and Barrington Cooke is associated with the suggestions of Calvert and Fordsham, in the pages of the *Lancet*. But Lister renders the idea practical. To confirm this, we have read the *Bulletin* of the Academy of Medicine of Paris, and its *Mémoires*, for a period covering approximately 1823 to 1865, the *Glasgow Medical Journal*, and the *Edinburgh Medical Journal*, as well as the *Lancet* for an equal period. It was in 1867 in the *British Medical Journal* that Lister published his studies upon the Antiseptic System of Surgery.

This may be called the period of steel and oil in surgery. With the adoption of anesthesia, all the pages are dotted with designs and advertisements for surgical instruments. In equal prominence, we see the use of mineral oil of coal-tar for disinfection, so-called.

Now it is the precise nature of the opinion upon disinfection which held back antisepsis. We read page after page upon this question, as to whether the smell is the infecting agency or medium, or whether some other insensible element is operative. This was at the root of the Hunterian maxim to allow the scab to form and remain well crusted, for fear of the entrance of air, with foreign products, and also to retain the ammonia of the blood. Lister, as early as 1858, went over the reasons for the opening of the wound, and the control of hemorrhage. But he does not seem to have known of the exact trend of thought in the Paris Academy. On December 17, 1861, the notable paper upon disinfectants by P. Chalvet was read. Previous to this, Depaul had exhaustively discussed the cause and treatment of puerperal fever, as brought up in the paper of Guèrard. Semmelweiss was referred to, and his idea that adventitious matter was responsible for the frightful ailment was spoken of reassuringly, with the comment that he had reduced the death-rate by cleanliness, and that his use of chlorid of lime to brush the hands and fingertips was valuable,especially in times of prevalent sickness. From this effort the sterilizing proceeded through Germany, and we connect the line with the references of Fordsham and Calvert in the *Lancet*, in 1862 and 1863.

Returning to the essay of Chalvet we learn that Ambroise Paré had employed antisepsis. Bouley of Alfort denied the need of more than pure, abundant air. But from the Alfort school proceeded the work of Velpeau, who generously shared credit with each and all, so far as to defer to someone in Marseilles who thought himself first to devise a plaster-and-tar dressing. This became known as of less value than Velpeau's, after the Marseilles' treatment was freely tried out at Alfort. The crux, it seems, was that these disinfectants did not disinfect cancer. And to the lack of understanding of the nature of epithelial neoplasms we owe the delay of antisepsis. Moreover, the appearance of pus was thought to be due to the patient's tissue, and not ascribed to a reaction to antigen. So we read of laudable pus, and Ashhurst in 1896 in this country taught that some pus is "laudable." Chalvet shows that Nonat as early as 1823 used chlorine as a disinfectant for antiseptic purposes. The acceptance of Lister's "system" and its early rejection in favor of asepsis, will lead us to acknowledge that Lister merely resuscitated a well-known method at the psychological moment, when Pasteur had caught our eye with the germ theory of disease. For Hunter, according to French authorities, knew of this antiseptic use of chlorid of lime, and of caustics, against virus. A druggist, named Duroy, presented to the French Academy of Medicine in 1853, a method of antiseptic treatment of wounds by iodin. Velpeau stated that for thirty years he had known of the value of iodin as a disinfectant and had so employed it. Chalvet goes on to say (1861) that potassium permanganate is and promises to remain one of the best disinfectants. Chaumette in 1851 employed coal-tar for surgical procedures, with success. The use of chlorinated lime for dressings and for operating purposes was stated to be regular French practice.

In the *Lancet* of 1860 we read of Hervieux of the Société des hôpitaux des Paris advocating chlorid of lime as a surgical antiseptic for operating and for dressings. Two years later the *Lancet* (P. 698) advises us to carry a red hot shovel laden with juniper berries through any sick room as a disinfectant, for the wounds of patients! A correspondent for the same journal wrote from Paris that iodin applications are much in vogue. The *Lancet*, commenting upon Renault and his coal-tar mixtures and upon the discussion then active as to whether it was the plaster or the tar which was the efficient disinfectant, says that we may go back to Bishop Berkeley, or to Sirius, to learn that coal-tar is the agency. Chalvet speaks of the surgical use of calcium hypochlorite when the edges of the wound can be coapted.

Now this is all anterior to the sixties. Lister had not employed phenol until 1864, according to his own accounts, and then when the papers of Chalvet were extant in the Paris Mémoires. He is anteceded by Semmelweiss as well as by Velpeau with iodin, Chalvet with potassium permanganate, and by Calvert and the Germans with coal-tars, phenol, and creosote. There are some who might think that this reasoning would give Lister second rank, but Lister, with characteristic fairness and modesty did not lay claim to a discovery. In 1874 he wrote to Pasteur:

"Allow me to take this opportunity to tender you my most cordial thanks for having, by your brilliant researches, demonstrated to me the truth of the germ theory of putrefaction, and thus *furnished me with the principle* on which alone the antiseptic system can be carried out. Should you at any time visit Edinburgh, it would, I believe, give you sincere gratification to see at our hospital how largely mankind is being benefited by your labors. I need hardly add that it would afford me the highest gratification to show you how greatly surgery is indebted to you."

Others had worked along aseptic and antiseptic lines, but it remained for Lister to see the wonderful importance of these remarkable discoveries and to bring them down to a practical surgical basis.

There is, however, a province in which he was and always will remain supreme as student, investigator, and physiologist. We are again listening to the Croonian lecture. He first recognized hormones. These he did not distinguish by such a term, but in his studies of the changes of pigmented bodies in the frog, he shows recognition of the fact that certain elements have the function of bearing from one site to another, essential values in the physiological mechanism. These are hormones, of course. He recognized, also the essential nature of chemotaxis, and in his studies upon inflammation, he has shown the "stickiness" with which the cells appear to become affected in this reaction. He minutely describes the changes in the cells and in the bloood-vessel walls coincident to inflammatory processes. That he should have foreseen both the principal of chemotaxis and the nature and function of hormones establishes his claim to our laud for ever and ever. These facts are durable and fundamental, essential and elementary. And to Lister must be accorded praise for his magnificent generosity and perfect humanity. He was one of the first to treat hydrocephalus with iodid of potassium—and cured, thereby, syphilis(?).

The Jenner Institute of Preventive Medicine changed its style to that of the Lister Institute of Preventive Medicine in 1905. It was a well-won tribute of efficiency. What he saw and described will remain valid. This is the outcome of a poised and evenly balanced mind. Lister was a surgeon of the highest judgment—what more can be said?

Electrodiagnosis.

I. Peyrou in the *Annales d'Electrobiologie et de Radiologie*, Paris, 1911, says that he uses currents of high frequency to treat prostatitis. It is successful.

II. Beclere writes upon the ionization of body tissues by the Curie method of piezo-electric quartz, which enables us to regulate the quantity of radiant matter introjected.

III. Doumer, in the April issue of the same journal, describes a method of taking the electric reactions in electrodiagnosis by condensers, instead of by polar shock. He employs a microfarad as unit. This machine should register 10.0, 1.0, 0.1, 0.01 microfarads. By these four units we avoid the need of currents above 110 volts.

ACUTE POLIOMYELITIS IN IOWA.

Iowa has suffered from two epidemics of acute poliomyelitis, one in 1908 and the other in 1910, there being 654 cases reported in the latter year. Owing to its virulence the State authorities took cognizance of the matter and the disease is now reportable.

Bierring (*Interstate Medical Journal*) writes that while children are largely the sufferers, of the 654 cases reported in 1910, 95 were fifteen years of age and older, 24 of these being over twenty-five years of age. Of the 68 cases reported in 1911, 15 were over fifteen years of age. The sexes were about equally divided. If the mortality can be regarded as an index, the virulence of the epidemic was of rather high degree, as there were 157 deaths in 1910 in 654 cases, and 12 deaths in the 68 cases that had been reported to December 1st, 1911.

He calls attention to a possible connection between poliomyelitis and chicken and hog paralysis, as the disease in the chickens and hogs was prevalent in several places when children and adults were suffering from a disease of similar nature.

The treatment consisted in quarantining patients, spraying the nasopharynx with a 1 per cent. solution of hydrogen peroxide, keeping the bowels open by active catharsis, thus lessening the blood pressure, depleting spinal cord circulation and preparing the alimentary tract for rapid absorption of medication.

Gelsemium was employed to advantage and hexamethylenamine was very extensively used. Its use in experimental poliomyelitis and subsequent demonstration in the spinal fluid affords the unique example of a chemical body being eliminated by way of the cerebrospinal fluid.

The dose was from five to fifteen grains every three hours according to the age of the patient. Rest and massage are essential and Bierring advises consultation with an orthopedist for the restoration of functional ability when lost.

CRILE'S SHOCK RESEARCHES.

At the last meeting of the Southern Surgical and Gynecological Association, Dr. W. P. Carr of Washington, presented chemical facts confirming Crile's conclusions on shock.

Carr stated (*Med. Rec.*) there are three dangers in surgery, hemorrhage, sepsis, and shock. Ambroise Paré opened the way for preventing hemorrhage, Pasteur, Koch, and others for preventing infection, and now Crile has done the same thing for shock. He cleared up the mystery surrounding the subject, put shock upon an anatomical basis, and gave it a definite entity. He discovered the chief causes of preoperative and operative shock and prevented it in animals. Finally, he was able to operate upon the most susceptible class of cases in human beings with almost no shock. He had shown that shock was the exhaustion of part of the protoplasm of brain cells, the shrinking of the nucleus and the dissipation of Nissl's granules, from powerful or repeated discharges of nerve impulses, and that these impulses were discharged automatically and involuntarily under the stimulus of afferent impulses received by special peripheral nerve terminals or special sense organs, and transmitted to the brain through afferent nerves. There were no receptors in the brain for such impressions.

These afferent impulses causing shock were suggestive of great evil to the organism through previous experiences or through phylogenetic association, and were noxious or noci impulses, causing powerful discharges of brain cells regulating the muscular mechanism of defense or escape from the suggested evil. There were no noci impulses in the brain. These noci associations or suggestions might be conscious or subconscious in character and were not inhibited by chloroform or ether anesthesia. The inhibition of muscular response by the will or by anesthesia did not prevent discharge of the brain cells and the same amount of exhaustion of these cells occurred as if the muscular action of escape or defense were fully carried out. Nitrous oxide anesthesia prevents shock to a marked extent, however, and is highly recommended for this reason. Cutting the afferent nerves or blocking them with cocaine prevented shock from trauma.

Fear is a powerful factor in producing shock. Crile's anoci-association operation was designed to prevent fear and all noci-associations and impulses from reaching the brain, and had been brilliantly successful in practice. Carr afforded clinical facts showing that when anoci-association operations were done accidentally there was no shock, and even when the plan was incompletely carried out there was much less shock than similar operations usually cause. He cited high forceps delivery as a typical anoci-association operation because the brain itself had no receptors for noci-associations, and the infant no mechanism sufficiently developed to receive or transmit them, consequently his brain might be compressed, mashed out of shape, even lacerated, without it making a single impulse for defense or escape, and he arrived strong and vigorous and without the slightest shock. All these things strongly tended to confirm the conclusion that Crile's observations had led to, namely, that fear in some form was the chief factor in producing shock, and that the impulses of fear or dread acting upon the brain cells previous to operation were often more potent than the subconscious associations and suggestions during the actual operating.

THE ORGAN OF HEARING AND RAILROAD MANAGEMENT.

The ear in connection with railroad management was a topic discussed at the Congress of Medical Officers of Italian Railways at Florence. Dr. Grazzi (*Jour. Laryug.* Dec., 1911) explained the damage which is suffered, both by travellers and by employes, closely related with the working of trains, through the transgression of certain rules of hygiene concerning the principal respiratory passages and the organs of hearing themselves.

As a remedy for such great inconveniences he advised the diffusion of otological knowledge among medical men and the public. For the first of these it would be necessary to render the teaching of otology obligatory in all the universities, whereas at present in Italy there are few colleges set apart for this most important branch of general medicine. To obtain the second he recommends the diffusion of elementary facts concerning the hygiene of the ear and of the principal respiratory passages by means of practical manuals to be distributed gratis among the employes of the railways, and of suitable advice printed on sheets to be affixed in the waiting-rooms of the stations for the instruction of travellers.

Finally, to obviate the various dangers which the organ of hearing undergoes, not only in those who are immediately connected with the working of trains but also in those who travel, Dr. Grazzi believes it would be of great use and of immediate effect to lower, as far as is possible, the tonality of various acoustic signals actually in use upon the railways. By lowering, with due precautions (suggested by physical and suitable experiments), the acuteness of whistles, bells, sirens, etc., as is done in many steamers, their efficiency would not be diminished and the acoustic organs of the employes and the travellers themselves would be spared immeasurable damage.

A case is reported by Porak (*Progrès médical*, January 6, 1912), giving the syndrome of hepatic colic, biliary obstruction, pseudo polymorphous erythema, and septicemia. The patient was a woman of thirty-one years, who gave a history of chills, high fever, grave malaise, agitation, cyanosis, headache. Two attacks of biliary colic were noted. Drigalsky plates gave distinctive colonies. A parallel case of Wiens, working under Struempel, is appended.

Current Orientation

BACTERIAL VACCINES AND SERUM THERAPY.

During the past year various studies touching upon phases in dispute have appeared. The question of immunity, active and passive, the manner of production of leucocytosis, the development of antibody and the nature of complement, are regarded. As is known, the hemolytic power of differnt erythrocytes constitutes the deciding point in certain diagnostic procedures. Antigen, or the infecting irritant, is that which we encounter in the study of pathogenic micro-organisms. The antibody is produced as a result of attempts of the organism to develop active immunity. Complement is probably developed in the serum, and enables the antibody to act, the complement being a binding or mordant possibly.

Serums convey the products of an active immunization, and enable the patient to become passively immunized. Bacterial vaccines cause a production of antibody. The bacteria are introduced killed. In this form they allow the formation of antibody, but are less likely to cause serious reactions, certainly not to cause specific pathogenic ones. Relevant to this we have the studies of H. L. Smith (*Revista de Sanidad Civil,* July 20, 1911), who shows that a mixture of morfin and hydrochlorate of quinin causes phagocytosis. The formula is. 10 grams of the salt of quinin to ⅛ gram of morfin. Smith says that this mixture acts as a chemical opsonin. Handmann (*Revista De Sanidad Civil,* August 10, 1911) says that the opsonin of diabetic blood is present, active and undiminished. Some local condition of the tissues must be responsible for the greater liability of diabetics to streptococcic and staphylococcic infections.

Passing over the recent contributions to serum therapy, we find the work of Schreiber (*La Pediatrie pratique,* November 5, 1911), who praises serum treatment of acute anterior poliomyelitis. He shows that Flexner and Lewis have demonstrated that the mucosæ of the nasal, olfactory and pharyngeal tracts are charged with the virus. In the *Journal des praticiens,* December 16, 1911, he is quoted editorially as advising, accordingly, the careful cleansing of these mucosæ.

Dopter (*Paris medical,* August 5, 1911) recalls that Flexner showed the virus to exist in the tonsil, and that there is considerable resemblance between the virus of acute anterior poliomyelitis and the virus of cerebro-spinal meningitis. The serum treatment of cerebro-spinal meningitis is complicated by the fact of the recognition of the parameningococcus (Coccus meningitidis Dopteri). When an infection is due to this variant infection, the Flexner and other serums may and usually do not act well. The parameningococcus does not show differences which can be clinically determined, and therefore is dangerous in its lack of response to ordinary therapy.

Before the Paris Society of Medicine, February 25, 1911, Levassort drew attention to the need of legislation regarding the choice of names for serums made for commercial purposes. The difficulties presenting in choosing a name are many. Chemical and technical words cannot be copyrighted. The selection of new-coined words is responsible for many queer terms. Just what names should be chosen would be very difficult to legislate upon.

February 23, 1911, the Paris Academy of Medicine passed a vote supporting Vincent and opposing Delorme in regard to the use of antityphic vaccine. One December 5, 1911, the same society listened to the reports of Vincent upon work done on soldiers in Morocco. (Vide the editorial in this issue on the subject of typhoid fever, wherein will be found a report on Vincent's findings.) On December 17, 1911, Netter, before the Academy, said that Vincent is correct. In the United States of America all the soldiers have been vaccinated and the dosage is ½ cubic centimeter at the first dose, with one cubic centimeter the second and third times. *Le Progrès médical,* December 30, 1911, reports the remarks of Chantemesse at the Paris Academy, who says that in the United States, England, Germany and India good results are obtained.

Passing to the treatment of hemorrhages by serum we encounter the studies of Broca and Weil, first in the Surgical Society, June 22, 1910, and later in the *Journal des praticiens,* September 9, 1911. Lapeyre has used serum injections for metrorrhagia. Clots must be removed from the bleeding surfaces. The serum is locally applied. Weil goes back to his work extending from 1905 to 1911. Both Claude and Duke have done work. The hemorrhages of tuberculosis are controllable at times by serum injections, so that while at the earlier date the effort was to control dyscrasic hemorrhages, now we can hope to affect those not dyscrasic, but simple, succeeding a vascular lesion, as a trauma, an aneurysm, ulceration of a tuberculous or cancerous type, or of some circulatory trouble in general.

Venomous Snakes.

Brazil of Butantan (Brazil) has been studying venomous snakes. He is working out an antivenomous serum. He was led to this by the similarity of the effects of snake bite and those of yellow fever. Sanarelli and Herwig had noticed this. The anatomo-pathologic lesions are strikingly similar. Nowak concludes his treatise upon the histo-pathology of snake bite by saying that he need only transcribe that of yellow fever. Bettencourt essayed to treat yellow fever by injections of antibothropic serum by availing himself of the anti-hemorrhagin noted in anti-venomous serum by Flexner and Calmette. This causes Segard (*Paris medical,* March 25, 1911) to say that the future may see a change in our attitude toward the serpent, in finding him a precious ally rather than an enemy.

Following the studies of Arthus, before the Academy of Medicine of Paris, regarding the use of antivenomous serum, anticobraic serum, antibothropic and anticrotalic serum, we find he takes up the employment of venom of Lachesis lanceolatus, of Crotalus terrificus, and of Crotalus adamanteus. At the session of December 26, 1911, he shows the incontestible similiarities among the venoms of these latter three. Tests upon rabbits induced sanguineous coagulation and death, but minimal doses produced a diminution of coagulability, and a later fall in arterial pressure, accompanied by a respiratory acceleration. Serums are produced acting upon these venoms interchangeably. The action of these serums, however, is not general, says Arthus. By this he means that an anticoagulant serum or an antidepressant serum cannot be used against venoms except in an autochthonous manner. Each biotype produces its own specific serum.

Tuberculins.

So much has been written and so many interminglings of the one truth, that only the supreme importance of reaching some exact basis could excuse the continuous repetition of ideas from observer to observer; and, this review will attempt to give even with these overlappings the gist of last year's output. It is evident that the thousand or more writers cannot be epitomized. Some of the more important will have to give place to minor writers at times, because the special fact is found with them. Some chief or succinct accounts can be included.

We find that veteran, Noel Fiessinger, compressing to essentials what we know: In treatment (*Journal des praticiens,* December 30, 1911) first of the technic, before injection, consider the general state of the patient; for five days

take the temperature four times a day, weigh the patient week by week, and connote with local pulmonary lesions. Make the injections subcutaneously, at the edge of the breast, or in the abdominal wall. Guard your solution, so that it does not deteriorate. Darkness may be essential. Be surgically sure of the exactness of the solutions. After injections order a day's rest. Continue the four-hourly taking of temperature. Examine the expectoration. Every two, three or four days examine and re-examine the lungs. Keep a chart showing the curve of weight. In the general treatment, remember, *a*, that the treatment must continue years, not months; *b*, avoid any sharp reaction; *c*, if any reaction, however light, occurs, await its disappearance, even for a month before re-entering the treatment, and resume by infinitesimal dosages; *d*, never augment, except by most gradual amounts, the dose of tuberculin and in resuming, after an intermission, choose weaker dosages than those at the time of cessation. Fiessinger says that those who are successful do not approach high dosages. Renon and Guinard do not pass beyond one-tenth to one-fifth of a milligram of solid tuberculin while Robin sets a limit of one one-hundredth of a milligram. The technic of Renon, Kuss and Robin are given and are similar. The tuberculin of the Pasteur Institute of Paris is preferred. Kuss uses any regular tuberculin. Sometimes he uses the solid, purified product.

Fiessinger says that at times the results are incontestably remarkable. How are we to explain what occurs? Tuberculin cannot produce an anti-bacillary action upon the micro-organisms at the seat of disease, for the bacilli there retain their virulency. It is also impossible to admit an augmentation of the antitoxic material in the fluids of the patient. The reactions of fixation of complement in patients under the treatment by tuberculin are positive in both them and controls not treated. The opsonic index is also variable and not indicative of consequential changes. In some, he says, the reactions of immunity are not present. This is not surprising, for we know that tuberculous infections do not confer immunity upon the patient who recovers. Bezancon and de Serbonnes have shown that tuberculous infection is of its own type in course and evolution. At first, tuberculin does not act as we would wish, and discouragement will be experienced. We do not find any increased production of tuberculous antibodies. (Are these antibodies real in tuberculous infections?) Tuberculin exerts purely a local or focal action. Robin says that there is an effect analogous to that of the treatments by creosote or by sulfur, only the action is more steadily maintained in the instance of tuberculin therapy. But there is some manner of effect upon the tuberculous focus; it becomes sensibilized, and at its margin shows a process which suggests anaphylaxy, and which is congestive in its manifestation of acute reaction. We know, parallelly, that such reactions exert positive chemotaxis for the polynuclears.

Fiessinger, as shown in conjunction with Coyon and Laurence (*Journal des praticiens*, October 2, 1909), describes the apportation of proteolytic ferments to the tuberculous lesion. The bacillus at the site of lesion is activated or sensibilized by the lipase of the lymphocytes there. The bacillus loses a portion of its adipocerate covering which ordinarily prevents its phagocytic solution. The proteolytic polynuclears complete what the lipolytic lymphocytes began. This terminates the digestion of the previously sensibilized bacillus. We must refer to the note of Fiessinger (*Revue de la tuberculose*, June, 1910), concerning the role of lipase in our defenses against bacilli. Seeing this, we can understand how the action exerted must remain upon the edge of the lesion. But the clinician has more than this to understand in the application.

Renon asks plainly (*Journal des praticiens*, October 25, 1911) whether we dare employ tuberculin in febrile cases. This he decides in individual cases. Renon says that many attempts to use Beraneck's tuberculin under the advice that it is an antithermic have failed because the clinician has not studied his case. He says that this could have been avoided if the physician had individualized. Contrary to serotherapy, which is a form of passive immunization, tuberculin therapy is an active immunization and costs the patient whatever the production of antibody demands. He may not be supplied with this necessity and pays dearly. To obtain results by tuberculin it needs be that the patient is able to react and without exhaustion. If he does not react, we have merely effected an addition to the amount of antigen (bacillary poison) within the unlucky sufferer. Theoretically, when the patient is unable to react, we should choose a serum treatment. The fever is in direct relation, in tuberculous processes, with the gravity of the infection. In a clinic alone, where exact measurement may be accomplished, should any febrile case be given tuberculin.

Renon continues his warning as to minute doses. It will not matter whether the tuberculin of Beraneck, of Denys, or the tuberculin CL of the Pasteur Institute at Lille (Calmette's tuberculin) is employed, trouble will follow if the rules of minuteness of dosage are relegated to obscurity. Renon says Guinard prefers a non-precipitated tuberculin, such as that of the Pasteur Institute at Paris. Renon does not care for alcoholically precipitated tuberculins. Any of these will serve, if the case be not pyretic, but when merely low fever exists caution will enable us to treat the patient with hope of benefit. Renon suggests reference to Kuss' book on Treatment of Tuberculosis, 1911, page 587.

J. C. Lyter (*Journal of the Missouri State Medical Association*, January, 1912) says he has noted in cases in which there has been failure to obtain a positive Moro or von Pirquet reaction in a normal, pretuberculous or latent tuberculous case, the administration of Bacillus emulsion (B. E.) will convert this negative into a positive reaction. He says that he accepts this as indicating the essential production of antibody, for the normal as well as the tuberculous individual. Now he says are these normal persons truly so? For if a normal individual can be made to produce antibody it shows that this has been accomplished to enter into reaction with the tuberculin of the Moro test, and if it occurs only in the tuberculous, we may say that a condition of supersusceptibility (cf. anaphylaxis) has been induced. This would render the Moro or the von Pirquet more delicate. It would approach then to the Yamanuchi reaction. In using the bacillus emulsion we should well begin as low as one-twentieth or one-tenth microgram (0.00005 mg. to 0.0001 mg.). Meakin is quoted (*Canadian Medical Journal*, March, 1911) as endeavoring to ascertain the susceptibility of the patient by graduated dosages of O. T. (old tuberculin). One-fifteenth of the amount of that used in the successful von Pirquet will produce a reaction when given therapeutically subcutaneously. One-thirtieth will produce only a local reaction so given, and one-fortieth will produce neither a local nor general reaction, hence is safe. Of twenty-four cases treated recently, two were harmed, seventeen were benefited and four remained the same. He prefers B. E., but has used B. F.

Serums used. Robin, before the Paris Academy of Medicine, presented the work of Mongour, of Marseilles (*Journal des praticiens*, June 24, 1911), the serum of Marmorek being used in acute cases with excellent outcome. Robin has used this serum effectively in his own work. We should extend the course of treatment over several months, with intermissions of periods of ten days.

Guinard and Renon (*Journal des praticiens*, October 21,

1911) go over the question of the use of serums in tuberculosis. They say that it is astonishing how good the results are from altogether diverse preparations. The guiding principles of these are, on one hand, to select soluble products or bacillary extracts divested of their bacillary elements, and others employ not only the emulsions of bacilli, but living and virulent ones, on occasion, with the animals chosen as ground of serum production. Thus the serums are variously derived from them in source and chemistry. The writers conclude by expressing the hope that animals so superimmunized may give us a serum capable of fully combating the scourge.

J. Laurence, speaking editorially of the use of serums and bacillary emulsions in the treatment of genito-urinary tuberculosis (*Journal des praticiens,* August 26, 1911), says that Lelongt expresses his greatest belief in such treatments, and that they have proved of real value. The immune bodies of Carl Spengler, which are neither a tuberculin nor a serum, and both sensibilized tuberculins and serums of tuberculous preparation, are all discussed. Six serums given us by Maragliano, Marmorek, Lannalongue, Achard, Gaillard, Arloing, Vallee and A. Jousset are in use. Lelongt records the tuberculins of Calmette, Arloing, Ramond and Ravaut in France, and some twelve others. Teissier of Lyons advises their employment before doing a nephrectomy. (This is questionable, in the light of American authorities, who prefer to operate and administer the serum afterward.) Lelongt advises great prudence in administration. He says he has conducted seven cases to a practical resurrection. Death in one case was not due to the tuberculin, although it was used in the treatment. Laurence warns us to proceeds coolly in our choice of all these measures.

Fiessinger speaks editorially (*Journal des praticiens,* August 19, 1911) of the serum of Vallee. This is valuable as an anti-microbic, antitoxic and antiendotoxic treatment. Maragliano's serum is obtained by the injection of heated bacilli, and that of Marmoreck by injections of filtrates of cultures. Vallee's preparation is collected a month after the last injection and heated four times to 56° C. for an hour, and then preserved six months on ice in the hope of reducing any possibility of anaphylaxis. Marcel Pinard, H. Salin, and Vanney have recorded accidents in the course of serum treatment, but these they say are of little gravity. Rashes or arthralgias are included. Calling anaphylaxis the phenomenon of Arthus, Fiessinger says that it is usually attenuated in serum treatments in tuberculosis. But Leon Bernard and J. Paraf, in the proceedings of the *Societe d'etude scientifique sur la tuberculosis,* April 6, 1911, report four grave occurrences. Feissinger advises us not to allow these accounts to discourage us. The individualization of a case is the necessity which obviates any reluctance on our part to apply safely these newer procedures.

Thibierge and Weissenbach presented three cases of Bazin's indurated erythema and reported upon two more cases before the Paris Hospital Association, March 17, 1911. (*Progrès médical,* March 25, 1911). This ailment has been considered tuberculous. Lupus erythematosus or the indurated erythema of Bazin passes through such a chronic course that we should accord some praise to any treatment which ameliorates it. This occurred in these five cases under solely antituberculous treatment.

Tuberculous Rheumatism, so called by Poncet and Hollos before the Paris Hospital Association, April 25, 1911, and in the report (*Journal des praticiens,* May 6, 1911) by Fiessinger, has been treated by the immune bodies of Carl Spengler. The cases were either benefited or cured. The writers take occasion to say that these tuberculous rheumatisms were in part typical articular tuberculosis, and others were of the subacute arthropathic type, or chronic articular painful processes. They were rebellious to the salicylates. The von Pirquet or the Moro would have been instructive.

Surgical Employment of Opsonic Treatment.

Not only as a means of guidance, but as direct therapy, the use of bacterial vaccines, say Constantinescu and Gomoiu, in the *Revista Stiintelor medicale,* Bucharest, Roumania, April, 1910, offers more to us. Wolfsohn uses it in tuberculosis surgically. He mentions certain groups of cases which he says are indicative of the need of bacterial vaccine treatment: Affections of the spermatic tract, of the mammary region, axillary adenitis, and lupus. Walker for genitourinary tuberculosis and Ohlmacher in bacillus coli infection of kidneys have had two excellent cases. Churchill and Soper and Butler and Long, in cases of vulvovaginitis, have had success. In furunculosis, Abelman and Wolfsohn use the specific staphylococcus. The latter treated three cases of osteomyelitis, two of which died, with specific bacterial vaccines. These were staphylococcic. But in streptococcic infections of the type of phlegmonous infections, erysipelas, puerperal infection and septicemia, Ohlmacher has had good results. The dosage of staphylococcic vaccine is frequently higher than that of streptococcic vaccines. Gonococcic infections, according to Stewart, Mante and Dieulafoy, and gonococcic septicemia, chronic blenorrhagia, and complications of the genitourinary tract incident to blenorrhagia, are amenable. Gray, Collier, Maiocchi, Ogilvie, Gautier and many others have gone over the ground.

Prophylaxis by Bacterial Vaccines.

Passing to the newer field, Ritchie advises the employment of anti-streptococcic vaccine before operation. This he recommended as early as 1908. He says (*Edinburgh Medical Journal,* 1908, p. 295) that in extensive infections requiring surgical intervention this will assist much. But Tuffier, as quoted by Constantinescu and Gomoiu (*Stiintelor medicale*) (*vide supra*) says that the results are not surprising.

Pneumonia Under Vaccine Treatment.

Robertson and Illman (*Pennsylvania Medical Journal,* January, 1912) say that in some instances strikingly prompt results follow the use of bacterial vaccines, but these effects are not uniform. The manner of preparation of the vaccine must be careful, for heat may destroy the value of the constituents. They do not care to discuss the value of the nontoxic and antigen-creating moiety of autolyzed pneumococci as prescribed by Rosenau. Nephritic complications are very serious, if not fatal, when pre-existing. And upon renal inflammation bacterial vaccines such as these writers used seem to exert no influence. The mortality of cases of pneumonia treated *with* bacterial vaccines was lower than those *not* so treated. Craig has had excellent results (*Medical Record,* February 12, 1911). Of eight cases in aged patients, all recovered. Willcox reports (*Lancet,* August 13, 1909) the results of 24 cases. In eight, the temperature fell by lysis. Robertson and Illman treated 20 cases, and report a mortality of 15% excepting one death from uremia.

General views upon Serums and Vaccines include those of Egbert and O'Neill, who (*Yale Medical Journal,* November, 1911) say that after all, to date, there are only three successful serums: that for diphtheria, the antitetanic serum, and Calmette's antivenene. Serums, they remind us, may be either antitoxic in neutralizing the morbid products, or anti-microbic, the latter directly affecting the source of the antigen. The anti-rabic serum of Pasteur is not curative, only prophylactic. Haffkine's prophylactic is a true vaccine and contains the actual (dead) bacilli. Vaccination against the plague with living, attenuated bacilli is reported

by Strong, of Manilla, who has satisfactory results and no untoward occurrences. Yersin's antipest serum at first gave brilliant results. Egbert and O'Neill say that of late its work is not so encouraging. Of pneumonia cases, sixteen gave a mortality of one. These comprise eight single and eight double pneumonias.

In the *California State Journal of Medicine,* July, 1911, a clear review of the entire field by Gay and Moffitt shows that the employment of vaccines centers upon autogenous vaccines, as soon as they can be procured. At the start the use of stock vaccines will afford some relief. Gilman Thompson (*American Journal of the Medical Sciences,* CXXXVIII, p. 169) says that in six cases of septic endocarditis and one case of streptococcus pyemia treated by polyvalent vaccines no improvement was noted until homologous (autochthonos) vaccines were obtained. Three cases of malignant endocarditis and one of pyemia were cured. The use of polyvalent vaccines was extolled by Thro before the Academy of Medicine in connection with a discussion of stock vaccines, for in this way we secure the best approach to an autochthonos treatment, until that can be instituted.

Staphylococcic infection seems to offer difficulties. The dosage is high. Mortality in general infections is high, also. In local staphylococcic infections, on the contrary, there is good success. The Rumanian report (vide supra) is therefore sustained by work in America. Deaver, DaCosta and Pfeiffer report four recoveries in five cases of pelvic abscesses, renal abscess, endocarditis, abscess of the scalp, and pyonephrosis, giving staphylococcic septicemia.

Antityphoid vaccination assumes large proportions. The monetary loss from this ailment is stupendous. Any means of prevention is to be welcomed widely.

The *Revista de Sanidad Civil,* Madrid, November 20, 1911, presents the curious statement of Guiard and Barabaschi to the effect that those who contract typhoid fever are in 95 per cent. bearers of intestinal parasites such as belong to the group of helminthiasis. They say that those who are free from these worms are practically safe.

Turning to work of Courmont in immunizing by mouth against typhoid fever, we find (*Progrès médical,* April 8, 1911) Courmont and Rochaix report to the Paris Academy of Sciences a ready manner of oral immunization. No disagreeable results are noted. Working with Krauss' serum, L. Russ, Jr. (*Revista Stiintelor medicale,* January, 1911) reports less favorable results. These, in part, may be due to the gravity of cases chosen for serum treatment.

The *Boston Medical and Surgical Journal,* October 19, 1911, gives the substance of the report of the French commission appointed by the Paris Academy of Medicine. This consisted of Chantemesse, Delorme, Kelsch, Landouzy, Netter, Roux, Thoinot, Vaillard, Widal and H. Vincent. They strongly support the use of antityphoid vaccine as a prophylactic. The report is analyzed in the issue of March 6th, 1911, United States Public Health and Marine Hospital Service. The *Canada Lancet* of December, 1911, goes over the ground again, as the importance of the subject and the eminence of the commission of the academy would warrant. There seems to be only one view, that of the value, efficiency and safety of this method of prophylaxis. President Taft, seizing upon the matter with characteristic executive ability, has already made our army acquainted with this procedure. The MEDICAL TIMES, February, 1912, prints many detailed notes of antityphoid vaccine, and the subject is treated editorially in this issue.

For a very clear study of the matter of serum and vaccine mechanism, the paper of William Rowland Davies (*Pennsylvania Medical Journal,* August, 1911) is of value. His ideas upon anaphylaxis would, in the understanding of many, require modification, in relation to serum-sickness and anaphylaxis, as he says they are identical. With this exception, and many may agree with him, his outline and diagrams are most instructive.

The Treatment of Malignant Pustule by Pyocyanase.

Dopter (*Paris medical,* September 9, 1911) says that anthrax may be treated in this manner after the method of Fortineau (*Gazette medicale de Nantes,* February 25, 1911). Rabbits treated with pyocyaneus vaccine are refractory to infection by the bacillus of anthrax. (Does this establish a community of interests chemically between the two bacilli ? Or are their products of a similar rank?) Dopter thinks the observations of Fortineau worth analysis.

Cure of Tetanus Treated by Serum.

The case of puerperal tetanus recorded (*Progrès médical,* August 19, 1911) by Courtellemont, of Amiens, is most interesting. Fourteen c.cm. of the serum was given epidurally, and six subcutaneously. At times the dose reached twenty c.cm. Eighty c.cm. in all were administered. Cases by Thomas, Towne and Magill in America, not puerperal or uterine, have been successfully treated. The success of this serum seems assured. Epidural administration may prove advisable, and in addition to the use of the serum, the administration of solutions of sulfate of magnesium, rhachecentesically, has been thought well.

Legal Relations of Experimental Serums.

Progrès médical, August 19, 1911, notes a decision of the Court of Cassation, which prohibits, in effect, any use of serums prepared except under government inspection and approval. This French law is analogous to those in our pure food series, but it is more extensive. No physician can prepare his own formulæ or institute experiments upon his patients.

Such is the substance of recent literature on this subject. The trend is evidently toward and not from special bacterial vaccines and toward a development of the field of serum-therapy by means of the creation of definite toxicologic formulæ of reaction. The study of proteolytic and lypolytic activities in ferments, bacteria and blood corpuscles indicates the only possible resolution of problems concerning immunity and cure of infection. Anaphylaxis must be studied in this manner as well.

Hydrogen Monoxid.

So many uses for this fluid may be known that it might seem supererogatory to name some. Nevertheless, the importance of water when needed, and the contempt we feel for so obvious an agent may excuse the review: 1. In the stadium of typhoid. Riesman, following good advice, says use water freely. The amount may total three quarts per diem. 2. In nephritis. A distilled water is a forceful diuretic. It is necessary to guard the skin during administration. 3. During fevers, as a diuretic and an intestinal corrective, also as a diluent of toxins. Robinson used to say that the amount of toxin per body weight is of moment. This assumes parallel body activity of defensive function. The ingestion of water adds to the dilution. 4. To cause diaphoresis, as following a hot bath. 5. As an excipient. This is a most important use. Medicines may be quickly and extensively responded to if given in plenty of water. The action of sulfate of magnesium is increased by solution. 6. As a local anesthetic. Hypodermics of sterile water are useful in minor surgery. Alcohol and water is also helpful. 7. Hot water in gastritis. Water employed thus for internal medication should have a modicum of sodium chlorid and calcium chlorid added. 8. For douches in gynecologic practice. Many ovarian and uterine conditions disappear before persistent and regular hot vaginal douching. 9. As a digestive stimulant. Small quantities of water, often repeated, will refresh and stimulate the appetite and digestive function.

The Medical Times

A MONTHLY JOURNAL

OF

Medicine, Surgery, and Collateral Sciences

ESTABLISHED IN 1872

EDITED BY

H. SHERIDAN BAKETEL, A.M., M.D.

Original articles and clinical communications will be welcomed, if given for exclusive use in this journal.

When authors furnish drawings or photographs, the publishers will have half tones and line cuts made without expense to the writers.

SUBSCRIPTION RATES:

(STRICTLY IN ADVANCE)

UNITED STATES, (Including Alaska, Cuba, Mexico, Porto Rico, Hawaiian and Philippine Islands)	$1.00 per year
CANADA,	$1.25 per year
FOREIGN COUNTRIES IN POSTAL UNION,	$1.50 per year

SINGLE COPIES, 15 CENTS

Definite written orders for THE MEDICAL TIMES are required from all subscribers, to whom the journal is thereafter regularly forwarded, until written notice to discontinue is sent to the publisher.

All communications should be addressed to and all checks made payable to the publishers,

MEDICAL TIMES CO.

ROMAINE PIERSON, *President and Treasurer*

H. SHERIDAN BAKETEL, *Secretary*

108 Fulton Street, - - - New York

Entered as second-class matter, Post Office at New York, N. Y., Act of Congress of March 3d, 1879.

NEW YORK, MARCH, 1912.

CHANGES IN THE TYPHOID SITUATION.

"Doomed to Death by Typhoid Fever" was a glaring newspaper headline which many years ago made a lasting impression upon the writer's youthful mind and caused the disease to be regarded with awe and trembling. The headline referred to a typhoid epidemic in a neighboring state, during which the mortality had been unusually high.

The disease has always been a trying one to the physician. From present indications we are getting "out of the woods," but our path to freedom from the presence of Eberth's bacillus is along the lines of prophylaxis, and not treatment.

The death rate until recently had changed in the aggregate but little for decades. In a study of 18,612 cases of typhoid fever made many years ago by Murchison the mortality was 18.62 per cent., or 1 in 5.4. James Jackson collated 303 cases treated in the Massachusetts General Hospital, with a death rate of a fraction less than 13 per cent., or 1 in 7. Austin Flint, Sr., in 73 cases noted a fatality of 24 per cent., or nearly 1 in 4. Difference in locality, season, circumstances and treatment doubtless accounted for the divergence of the figures, although the mortality at the Massachusetts General Hospital varied considerably in eight successive years. In 1828, 1 in 14 cases died; in 1829, 1 in 25; in 1830, 1 in 3.5; in 1831, 1 in 15; in 1832, 1 in 5.7; in 1833, 1 in 6.1; in 1834, 1 in 5.6; in 1835, 1 in 5.8.

After a lapse of three-quarters of a century it is interesting to study the typhoid death rate, as tabulated by the government for the year of 1910, in a particular registration area, which includes the states of California, Colorado, Connecticut, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina (municipalities of 1,000 population and over in 1900), Ohio, Pennsylvania, Rhode Island, Utah, Vermont, Washington, Wisconsin, and forty-three cities in Alabama, Delaware, Florida, Georgia, Illinois, Kansas, Kentucky, Louisiana, Missouri, Nebraska, Oregon, South Carolina, Tennessee, Texas, Virginia and West Virginia. The area had a population in 1910, estimated on July 1, as 53,843,896, or 58.3 per cent. of the country's inhabitants.

In this great area for 1910 there were 12,673 deaths from typhoid fever, equivalent to a death rate of 23.5 per 100,000 population. This was higher than 1909, when there were 10,722 deaths, or 21.1 per 100,000.

The mortality from typhoid is slowly decreasing, as with the exception of 1909, the rate in 1910 was the lowest since the government commenced to tabulate these reports in 1900. This is especially noticeable in that 1910 for the first time contains the typhoid statistics of Minnesota, Montana and Utah and North Carolina towns of over 1,000 population. For example the rate in 1906 was 31.3; in 1907, 29.5; and in 1908, 24.3. In 1910 the highest death rates from typhoid fever shown for the registration states were those of Colorado (41.9), Maryland (40.7), Montana (39.9), and Utah (37). In the North Carolina municipalities of 1,000 or over the rate was still higher (57.7). The lowest rates shown were New Hampshire (10.7), Massachusetts (12.4), Rhode Island (13.6), Vermont (14), New Jersey (14.5), and Connecticut (14.7). Of the registration cities of 100,000 population or over in 1910, Omaha, Nebr., had the highest rate (86.7). Other cities with high rates for the year were: Minneapolis, Minn., 58.7; Kansas City, Mo., 54.4; Atlanta, Ga., 50.1; Birmingham, Ala., 49.5; Nashville, Tenn., 48.9; Milwaukee, Wis., 45.7; Spokane, Wash., 45.4; and Baltimore, Md., 42. For Birmingham, Atlanta, Nashville, and Spokane high mortality from this disease was reported in 1909 as well as in 1910. The lowest rates shown for the large cities were those of Bridgeport, Conn. (4.9), Paterson, N. J. (7.1), Cincinnati, Ohio (8.8), and Cambridge, Mass. (9.5). These rates approach the rates of typhoid mortality of the leading cities of western Europe, examples of which for the year 1910 were as follows: London, 4 per 100,000; Edinburgh, 2; Dublin, 10; Paris, 7; Brussels, 19; Amsterdam, 7; Copenhagen, 3; Stockholm, 4; Christiania, 2; Berlin, 4; and Vienna, 4.

The bugaboo of typhoid might have been dispelled from the youthful mind of years ago, had mortality statistics been at hand in those days. Despite popular fear of the disease, it is not out of place to note that in the same registration area in 1910 there were 79,524 deaths from pneumonia as compared with 70,033 in 1909. In one year the death rate increased from 137.7 to 147.7 per 100,000. What a field pneumonia offers the research worker and what a halo will encircle the head of him whose efforts are crowned with success.

That which has been denied to pneumonia has been granted to typhoid. Little doubt as to the value of antityphoid vaccination remains, even to the most prejudiced. The latest evidence of this is a note recently published in the medical press to the effect that "as a supplementary preventive measure against typhoid fever in the ranks of the navy and the marine corps, the compulsory inoculation of all the officers and enlisted men of these branches of the service under forty-five years of age has been

ordered by the secretary of the navy." Last July vaccination against typhoid was made compulsory in the army. The prevention of typhoid among our troops in Texas during the recent concentration of soldiers in that state from every part of the country goes far to prove the efficiency of the vaccination.

Richardson and Spooner have made interesting comparisons of conditions in the Massachusetts General Hospital. They state that from 1902 until 1906, twenty-six nurses contracted typhoid fever, and that for each case of typhoid fever treated a nurse contracted the disease. In 1909 and 1910, 153 nurses were vaccinated and no cases of typhoid fever occurred.

At the recent meeting of the Southern Medical Association, Elliott, of New Orleans, said that 200 members of the senior class of Tulane University were vaccinated against typhoid. Only one case resulted and he was infected previous to vaccination. He referred to Cullinan's report of an epidemic in an asylum, where 500 consented to be vaccinated. Of these 1.3 per cent. contracted the disease, while among the non-vaccinated 14.6 per cent. were taken ill.

Captain Phalen, of the United States army medical corps (*J. A. M. A.* Vol. LVIII., No. 1), gives some interesting data on typhoid inoculation in the army in India from 1906-1910. In 1906, the typhoid rate was 15.6 and the death-rate 3.19 among a military population, 66 per 1,000 of whom had been inoculated. In 1907, the typhoid rate was 13.1 and the death-rate 2.77, the inoculated population being 143 per 1,000. In 1908, the typhoid rate was 14.5, death rate 2.76, inoculated population 225 per 1,000. In 1909, the typhoid rate was 8.9, death rate 1.58, inoculated population 613 per 1,000, while in 1910 the typhoid rate had fallen to 4.6, the death rate to 0.63, while the protected population had been raised to 823 per 1,000. Here the use of the inoculation must be given the credit for a reduction in five years of the typhoid rates from about 15 to less than 5 per 1,000, the death rate from over 3 per 1,000 to 0.63 per 1,000. Taking the year 1910, there occurred in a strength of about 70,000 men, 306 cases of typhoid, 155 in about 60,000 inoculated and 151 in about 10,000 who were unprotected. This gives a rate approximately six times as great for the uninoculated. Of those who contracted typhoid, 11.2 per cent. of those inoculated died, while the death rate for those not inoculated was 16.1 per cent.

During a campaign in Africa in 1904-1907, out of 16,496 soldiers of the German army, 7,287 were inoculated voluntarily. The typhoid rate was 5.09 per cent. for the inoculated, against 9.84 per cent. for the uninoculated. Among the former the death rate was 6.47 per cent. and among the latter 12.8 per cent.

As interesting as these figures are they cannot compare with the statistics of the United States army, which are delightfully startling. During the past three years over 60,000 men have been vaccinated against typhoid. Out of this number, twelve men developed the disease and *none* died.

In view of the wonderful results obtained by our army medical officers, than whom no army has better, by the way, it may be well to quote Captain Phalen's description of the preparation of the vaccine, which is furnished the army by Maj. F. F. Russell, of the medical corps: "The organism used is from an old culture which has ceased to be pathogenic and which produces an abundant growth on agar. It is inoculated on agar in specially constructed flasks giving a known surface of media. After eighteen hours' incubation the agar cultures are washed off with the normal salt solution, put into flasks, and the culture killed by subjecting it to 55-56° C. over a water bath for one hour. While sterilization is taking place, a count is made of the bacterial suspension for the purpose of standardizing, after which it is diluted with normal salt solution, so that 1 c.c. shall contain 1 billion bacilli, and 0.25 per cent. tricresol is added. It is tested by bacteriologic methods for both aerobic and anaerobic bacteria, and as a further measure of safety inoculations are made into guinea-pigs. It is then put up in sealed ampules containing 1 to 25 c.c."

Three injections are given at intervals of ten days, the first of 0.5 c.c. and the others of 1 c.c. each. Phalen has not observed severe reaction. There is hyperemia around the needle wound and a deep seated indurated and somewhat tender area. He has never seen axillary suppuration or sloughing around the site of the injection. The reaction is usually at its height 12 hours after injection and subsides within another 12 hours.

It is of value to note the results in other armies. In the French army in Morocco the troops were inoculated with Wright's vaccine and a polyvalent vaccine, a mixture of several strains of typhoid bacilli with paratyphoid bacilli A and B, and an autolysate of the polyvalent vaccine. Vincent (*Bull. de L' Acad. de Med.*, Dec. 5, 1911) states the Wright vaccine was used on 129 men and the polyvalent in 154. There was no reaction in 92.5 per 100 in which Wright's was employed, 81.48 per 100 with the polyvalent and 94.29 per 100 with the polyvalent autolysate. Vincent believes immunization against typhoid should be used in the French army, basing his belief on the comparative results in 2632 men, of whom 283 were vaccinated. Among the unvaccinated the typhoid rate was 64.97 per 1,000 and the death rate 8.35 per 1,000; among the vaccinated the typhoid rate was 7.75 per 1,000 and there was no death rate.

In the Japanese army (*San. Stat. der Japan Armee*, 1911) the typhoid rate among unvaccinated was 14.52 per 1,000 and the death rate 16.6, while among the vaccinated the typhoid rate was 1 per 1,000 and the death rate 7.7.

A commission was appointed by the French Academy of Medicine to view every phase of antityphoid vaccination. After a thoughtful consideration of the different vaccines, the reactions produced and the practical results obtained by vaccination the commission has reached the following conclusions (*Bost. Med. and Surg. Jour., Feb.* 1, 1912):

(1) Antityphoid vaccination has been practiced with success for several years in the English, German and American armies. The most frequently employed vaccine has been cultures of typhoid bacilli killed by heat.

(2) Typhoid incidence among soldiers who have been vaccinated has been at least one-half as great as that among the unvaccinated.

(3) Typhoid cases among the vaccinated have been much milder and the mortality from the disease has been one half as great as that among the unvaccinated.

(4) Two to three inoculations are necessary to make the vaccination effective.

(5) The immunity secured by the vaccination lasts from one to four years.

(6) Antityphoid vaccination has shown itself to be without danger, no matter which vaccine is used.

(7) For a period of one to three weeks following the antityphoid inoculation there may be a diminution of re-

sistance on the part of the individual to typhoid infection. Preventive inoculation should, therefore, never be carried out during an epidemic or on individuals who have been exposed within three weeks to infection.

(8) For the same reasons, persons vaccinated against typhoid must take special care for a period of about three weeks against exposure to typhoid infection.

(9) Antityphoid inoculation is destined to be of great service in the army and navy.

(10) Antityphoid vaccination should be prohibited in every subject threatened with typhoid or in the early stages of the disease as it may aggravate the course of the disease. Tuberculosis or any organic disease is a contra-indication to the use of the vaccine. Except in unusual circumstances vaccination should be avoided in weak and debilitated persons, as they give too severe a reaction.

(11) Antityphoid vaccination, while necessarily at the present voluntary, should be encouraged, and communities should be informed as to what degree of protection might be expected from it.

(12) The various forms of vaccines have proven themselves equally efficacious. Wright's vaccine confers a longer immunity.

(13) Among the persons who may be particularly benefited by antityphoid vaccination may be named physicians, medical students, nurses, persons in whose family there are bacilli carriers, persons who come from typhoid-free regions into cities where typhoid exists, soldiers and sailors who have to go to localities where typhoid is epidemic or endemic and inhabitants of cities where typhoid is frequent.

From the data herein set forth it is reasonable to believe that the typhoid rate and the typhoid death rate will be materially lessened in the future and that the startling newspaper headlines of other days will take their place with other relics of the past in the realms of innocuous desuetude, there to peacefully sleep forever and a day.

A FABLE AND ITS MORAL.

This fable is like most other fables with one exception. It is true. The moral is one which those affected would do well to heed.

Once upon a time a man child was born into this vale of tears. He was more favored than most infants, for his father was possessed of much world's goods and a great paternal pride. As the babe grew into a child and the child became a youth money and love were lavished upon him. All material things were his and he was showered with affection.

In early years he developed what was believed to be a bent toward medicine. He compelled his mates to feign illness and he administered imaginary pills and tinctures. He practised a rude surgery upon dogs and hens suffering from broken limbs and he was even alleged to have assisted in causing some of the fractures for the purpose of having clinical material. He soon acquired a single syllabled appellation, with which all physicians are cursed and this nickname clung to him ever after.

In due time the youth went to college, where his time was passed to his benefit, for he was a serious and studious person and it was his ambition to imbibe great knowledge. After completion of his course he entered a medical school and eventually was graduated as a doctor of medicine *Summa cum laude*. The young man loved medical study and was an unusual student.

After an eighteen months' hospital service, the embryotic physician entered practice in a city of 150,000 people, not far from his father's home. He rapidly established a good business. His skill, personality and natural talents were appreciated and contrary to the usual fate of youthful practitioners, his clientele was among those who believe it as necessary to pay their physician as their landlord.

Seven years later the doctor's father died and his executors found the estate so seriously involved, that when the debts were paid, little was left for the sorrowing widow and less for the son. But he cared not, for he was collecting from $6,000 to $8,000 a year. He had married and his mother took up her abode with him. For a time all went well, but then the serpent wiggled its sinuous way into the physician's Garden of Eden.

The doctor's engaging manners had attracted the attention of the local political boss and the doctor felt flattered when offered a nomination to the common council. He was elected, for the boss was one of the kind who not only bossed, but delivered. The life of the politician appealed to the doctor, for he was susceptible to flattery and in time his thirst for political power grew. Two years later he was elected alderman and his thirst was greater. The doctor failed to realize that his attendance at medical society meetings was giving way to picnics of the John Dunphy Association, or dances given by the Fourth Ward Jolly Associates and that instead of dropping in at the Academy of Medicine for a little study and a chat with the members, he dropped in at the Minnewaska Club, the headquarters of his party in the Twelfth Assembly District, for a game of pool and a bottle of beer.

From alderman to the Legislature was a short step. The doctor was all right, the boss said, and the boss knew. He was "a good fellow, always voted with the organization, and could be depended upon." The doctor was a good fellow, but he was lacking in moral stamina. In short his spinal column had become gelatinous.

The doctor went to the state capital Monday afternoon and returned on Friday. He ignored the fact that his practice would suffer, for the boss told him he would get something worth while, and he believed in the boss. For four years he stayed in the Legislature, his thirst unassuaged, his practice smaller and his polished manner contaminated by roughneck associations. The "something worth while" failed to arrive, though the doctor's love of beer, whiskey and poker was growing apace, and he dropped out of the Legislature to be a commissioner, where there were alleged to be "pickings."

For a time he fared better, but his professional life had practically given way to that of the politician. His good families, unable to obtain his services when needed and annoyed by his devotion to politics, had gone to other medical men and his little practice was among a very sordid element. His mother, worried unduly, went to the grave, and his wife, unable to endure changed conditions, returned to her parents. Still the doctor, lured on by that political will o' the wisp, continued with beer, whiskey, poker and politics, for the boss said "something worth while" would be his.

It came in a nomination for Congress in a so-called safe district. Here was $7,500 a year, and the Congressman whose recent death had caused the vacancy had served almost nine terms. To be a Congressman was worth while, and all else was as naught, the doctor thought. What if he did have to mortgage his house, all left of his worldly possessions. He was sure of that which the boss said was to be worth while. So the doctor put on the mortgage, contributed his mite, a paltry $5,000, and made his campaign.

All would have been well IF. Reform was in the

air. Vox populi was raised against the bosses and their creatures, who were denominated as "grafters" and "corruptionists." An aggressive, young, live-wire lawyer, not long out of law school, portrayed as "honest, faithful to the people's interests and absolutely incorruptible" was nominated against "The Doc." The boss laughed and so did his medical nominee, but not the people. When the ballots were counted the lawyer had gone in on the reform wave that swept his party into political power.

Where was his opponent and the $5,000 mortgage? "Poor old Doc," said his associates. "It was coming to him and to his ilk," said the other side. The boss was a boss in name only. Shorn of power and influence, he could not or would not help his fallen satellites to retrieve their lost political and financial fortunes. Medical friends of other days persuaded the powers that be to appoint the near-Congressman, who had lost wife, home, practice and reputation, a district physician. This he kept for a while, but his acquired vices overcame him and with an office over a saloon, he counted as his few patients only denizens of the saloon, dance hall and brothel.

Then came the denouement. An illegal operation, the death of the victim, a trial and a sentence of 20 years came in such rapid succession that before "poor old Doc" realized his condition, he was making brooms in a penitentiary workshop. There he is now, and there he will be for years to come, a victim of the political thirst which afflicts some men.

Haec fabula docet that the shoemaker should stick to his last and the physician flee from politics as if pursued by pestilence.

LORD LISTER.

"It is not a profession, not a nation, it is humanity itself which, with uncovered head, salutes you," said Thomas F. Bayard, then ambassador at the Court of St. James, in conveying felicitations to Sir Joseph Lister, who had just been elevated to the peerage under the title of Baron Lister.

With heads uncovered to the wintry blasts the world has said its "Hail and Farewell" to the father of antiseptic surgery, who has just laid down the burden of years and assumed the garb of immortality.

Mankind's debt to Lord Lister is immeasurable. His services to medicine place him at its forefront.

In the recent discussion as to the world's ten greatest men, almost without exception every list which appeared contained the name of Joseph Lister.

Nothing can cover his high fame but Heaven;
No pyramids set off his memories
But the eternal substance of his greatness.

Favorable Showing in Vital Statistics.

The death rate in the city of New York in 1911 was the lowest in the history of the city, 15.13 per thousand of the population. The death rate in 1910 was 15.98, a record until this year's figures were computed. There were 75,423 deaths in 1911 against 75,742 in 1910, and there were 12,816 less deaths in the tenements than last year. The number of births rose from 129,080 in 1910 to 134,542 in 1911, and the marriages increased from 46,417 to 48,765 during the same time.

The two papillary muscles play the most important part in the transmission of the insufficiency murmur from the mitral valve to the apex.

Mitral stenosis of high grade is much more frequent than many think. It is frequently associated with hemorrhage.

The Editors' Table in February

The *Journal of the American Medical Association* has presented a new study of the Coagulation of the Blood. The study of thrombin and of anti-thrombin appears important. The views of Howells are contrasted with those of Davis; the latter has inquired into the mechanism of coagulation. Lead poisoning is regarded. The nature of Brill's disease and of the tabardillo of Mexico is discussed in the light of recent government researches. It is stated that typhus may be of some incidence in our great cities, if the identity of the two morbid processes is granted. Coleman's views on high calory diet are considered. It seems wise to take 3,000 calories as the maximum in the stadium, at least, of typhoid fever. The *Journal* takes up the matter of the banana as an article of diet, and shows the high starch value. It does not think it is indigestible, or harmful, as starch is not harmful. It seems to us that the starch of the banana may differ in digestibility according to the particular form in which it occurs, and the amount of cellulose in the admixture. In the case of the banana, we have heard it said that salt is helpful to digest it. The action of salt upon the flow of diastasic ferment, amylolytic enzymes, may be similar to the effect of salt upon the salivary secretion—stimulatory. If this be true, the use of salt is wise. The *Journal* does not speak of using salt, but it does reassure us in the matter of the banana. The theory that diaphoresis is or may be made compensatory for or a vicarious means of nephritic secretion is demolished by the *Journal*. We still have a feeling of fondness for sweating a patient, he seems to do so well under the treatment, and we have been under the impression (really, conviction) that diaphoresis is a relief to the kidneys. So it is, one by one, our idols are overcast, and Ephraim himself could hardly be more joined to one than we to this notion. We ask, can the source of information to the *Journal* be in error? How is the toxin in eclampsia eliminated? Hirst has so drilled into us the need of earnest and persistent diaphoresis in the management of this dreaded and fatal condition. If diaphoresis does not relieve the kidneys in some compensatory manner, at least the toxins which would have been renally excreted are now cutically exuded. And so things which are equal to each other are, etc. The basis of occupation diseases is touched regarding lead poisoning. This recalls the magnificent generosity of Mrs. Harriman in New York City, and the equal readiness of the Academy of Medicine to attack and remove a serious problem. The introduction of the topic of sewage purification by calcium hypochlorite reminds us of the 1850's, when in France this subject received much ventilation, and truly brilliant discussion, considering that the germ theory of disease was quite unborn in the mind of Pasteur.

The *Policlinico* for January 7, 1912, presents some matters upon Leishman and Donovan bodies, and upon the spontaneous infection of dogs with the L. infantum. The Donovan body does not so act. Dr. Tramonti, of the staff of the *Policlinico*, is busied with Red Cross work in Tripoli, the city in which Dr. Basile has accomplished important prophylactic work.

In the December issue of the *Gaceta Medicál de México*, Valdés has an important study of vascular surgery. He refers to Carrell, Villareal and Lambert. Villareal is the present President of the Mexican National Academy of Medicine. Saloma asks whether in studying the possibility of typhus communication by the "piojo" our common, let us trust unfamiliar, louse, we can hope to have solved the problem.

The *Journal of the American Medical Association* brings up the question of danger in health resorts at which or in the vicinity of which there may be many consumptives. This has been carefully considered before. The *Journal* agrees that no danger exists. We think that certainly less should exist than when the consumptives are in their native cities and under no

supervision. A very interesting study of "fossil" words is given. Why not entitle them "fosilliferous?" The words contain, they themselves are not, the fossilized matter. We have read a paper in which the ascent and descent of the moral values was discussed. Fellow once was a term of reproach. Now the Members of the academies bear it proudly. Nice once meant some shame or other, and now it is a laudation. These words have come up. The word woman trembles in the balance. To say woman to one, might cause offense. To speak of her as one, ought not. Presently used to mean at once, in the immediate present. To say presently in this day means a variable delay in response.

The *Zeitschrift f. klin. Medizin,* Berlin, 1911, 74 Bd., Heft 1-2, gives a most important review of the work of Olaf Scheel of Christiania. He has worked out the bile content of the blood in various diseases: Cholemia, Cholelithiasis, Cardiac diseases, Pneumonia, Anemia, Cirrhosis and Cancer of the liver, Pervicious anemia and Typhus. The method reduces to twentieths the rapidity of reaction, using the hour as a unit of 20/20.

New Thoughts in Pediatrics

Vomiting of Infants.

H. Lowenburg, Philadelphia, says that the causes of vomiting in infancy are somewhat different from those of children a little past that period (*J. A. M. A.*). Therefore, he describes his subject and considers the vomiting of infancy and that of early childhood separately. In the first six months of life the stomach is almost entirely covered by the large left lobe of the liver, which interferes with its rapid emptying. This, together with the undeveloped valve action at the cardiac end, explains the easy regurgitation at this period. This might be considered physiologic but for the fact that, if untreated, it interferes with nutrition. It is generally due to overfeeding at irregular periods. The capacity of the stomach at birth is approximately one ounce or less, and it is a mistake to allow the child under one month of age to take four or five ounces, and vomiting thus induced may pass beyond control. Regularity of feeding is also important and too great frequency is as bad as too much food. Up to three months most infants do well on a two-hour interval and after that on three-hour intervals, gradually attained at the end of six months. Between six and nine months nourishment should be given three to three and a half hours and after nine months every four hours. During the first few weeks there may be two night feedings in weak infants. After the second month night feedings should be discontinued.

In bottle-fed infants the same general rules apply, but the composition of the food is more important. The ingredients most commonly at fault are the fats and sugars. The vomitus due to excess of fat is distinctly sour and acid, containing yellow curds, and there are also characteristic bowel symptoms which are not here discussed. The remedy is reducing the fats in the food, regulating the diet of the mother in case of a breast-fed infant and the food in bottle-fed ones. Sugar is not often the cause of vomiting, hardly ever in breast-fed children, and is commonly associated with watery diarrhœa. The remedy is an initial purge, rarely a stomach washing, a colonic flushing and reduction of sugar in the food. Congenital pyloric obstruction is too rarely diagnosed and it would be well to regard all cases of vomiting resistant to treatment and beginning at birth or shortly after as due to this cause until otherwise demonstrated. There is a kind of regurgitation which is entirely harmless though persistent for awhile, and is probably due to faulty habits or hygiene.

As a symptom of infectious or summer diarrhea, vomiting is almost entirely confined to the bottle-fed children. Occurring at the very onset of the disease it saves the stomach from irritation to some extent and is benign, but, continuing throughout, it is of bad prognosis and the treatment is not satisfactory. Lavage to be of use must give speedy results and not be too long continued. It may be necessary to suspend feeding by the mouth and feed by injection. The more common causes in older children are the acute infectious diseases, dietary indiscretions, poisons, acute abdominal disease, uremia, brain disease, acidosis or cyclic vomiting, so-called reflex causes and ocular conditions. It is an important initial symptom of scarlet fever, small-pox, meningitis and less so of measles and pneumonia. It is a prominent symptom of pertussis and is purely mechanical, while in the other disorders, except perhaps in meningitis, its cause is toxic. The usual trouble is dietary indiscretion, and Lowenburg advises special care in this respect. The active treatment, after eliminating the cause, consists in an emetic if it can be given early enough and, if the stomach is not too much irritated, gastric lavage. It is of diagnostic importance in appendicitis, nephritis and brain disease, and when every other cause has been excluded the eyes should be examined by a competent oculist.

Diphtheritic Blood Pressure.

The blood pressure in 179 cases of diphtheria is the subject of an article by Rolleston (*Brit. Jour. Child. Dis.,* 1911, reviewed in *Am. Jour. Med. Sci.*). Rolleston used Martin's modification of the Riva-Rocci instrument and he only took into consideration the systolic pressure as measured by the disappearance of the radial pulse. The pressure was taken daily in each case for from three to eight weeks, depending on the severity of the case. All the cases except 15 were children below the age of fifteen years. The maximum blood pressure of normal children, according to Seiler, who used the Riva-Rocci instrument, is 75 to 80 mm. from two to three years; 79 to 90 mm. from four to five years. Cook and Briggs found slightly higher figures with their modification of the Riva-Rocci, and place them at 75 to 90 mm. up to two years, and 90 to 110 mm. after two years. Of the 179 cases observed by Rolleston, 63, or 35.1 per cent. according to Cook and Brigg's estimate, and 45, or 25.1 per cent. according to Seiler's figures, showed for varying periods a pressure below the normal. The varying degrees of depression bore a direct relation to the severity of the attack, being pronounced in severe and slight in mild cases. In the very severe class, of 22 cases, 18 according to Cook, and 17 according to Seiler, showed from 5 to 45 mm. below normal. The fall in pressure occurred rapidly and steeply, there being at times 10 mm. difference between the morning and evening readings. A difference of the reading of the two wrists indicated a grave prognosis. The severe and the moderate class of cases showed a considerable fall, but less marked than in the very severe class; the severe class showing 25 and 16 cases respectively, with fall of from three to twenty-four mm. and the moderate class 11 and 6 respectively, showing a fall of from 1 to 14 mm.

The greatest difference registered was in one case, and amounted to 38 mm, The moderate class showed the least fall from normal. The occurrence of comparatively high pressures during the first week is due to febrile disturbance before the toxins had taken effect. The preponderance of the lowest readings in the second week accords with the fact that vasomotor paralysis occurs most frequently during this period. In 2 neurotic sisters, aged seven and nine years respectively, the readings ranged between 130 and 148 mm. Hg. for a month. The lowest reading in a case which recovered was 60 mm. in a girl aged three years. In the great majority of cases normal tension was regained by the end of the seventh week. As a rule, the pulse rate followed the degree of blood pressure. Out of 103 cases in whom comparison was made between the recumbent and the erect position in 48 the readings were the same, and in 32 the recumbent readings were higher than the erect. In only 23 was the normal relation found. This reversal is liable to

occur in convalescence from any acute disease. This indicates that the resumption of muscular work should be gradual in patients showing this phenomenon of effort hypotension. The increase of blood pressure was marked in the laryngeal cases, tracheotomy being followed by a considerable fall in pressure. Early serum rashes caused no increased pressure. Late serum disturbances after the second week showed a raised pressure in 40 per cent. of cases. The onset of albuminuria usually is accompanied by a fall in the blood pressure. This is exactly opposite from its effect in scarlet fever. Any changes of blood pressure occurring with early palsies were in a downward direction. During late palsies a fall was most exceptional. The estimation of blood pressure is not indispensable in forming the prognosis in diphtheria, the fatal termination being indicated by the characteristic features before the blood pressure had shown the evidence of depression. Favorable results are often found in severe cases by administration of 10-minim doses of a 1 to 1000 solution of adrenalin every two to four hours.

Nasal Diphtheria.

Burrows found diphtheria among the scarlet fever patients in his service at the Syracuse City Hospital and the condition continued despite his efforts to prevent contamination (*N. Y. State Jour. Med.*). Cultures of scarlet fever patients showed the presence of diphtheria with none of the usual clinical features. He found many scarlet fever patients had the Klebs-Loeffler bacilli in the upper air passages on admission, so that he finally required a negative culture of both nose and throat before the patient was taken into the institution. His experience led him to these conclusions:

First—That nasal diphtheria is a common single affliction, also a frequent complication of scarlet fever and other contagious illnesses.

Second—That the symptoms of nasal diphtheria are a bloody, or blood tinged, ichorous, serous discharge accompanied by crusting and excoriation of the septum, nasal apertures and sometimes of the upper lip. There may be in some instances a visible membrane somewhere in the nares. Itching is also a manifestation. These symptoms may be present in both nostrils or one. Occasionally the only observable early sign is the blowing of bloody mucous from the nose, the hawking of it from the naso-pharynx, or a trifling nose bleed.

Third—That the majority of the cases of nasal diphtheria are subacute and located in the anterior part of the nasal passages. Their danger seems to lie in the fact that they may induce laryngeal or pharyngeal diphtheria in those who come in intimte contact with them. The disorder does not seem to confer an immunity against a sudden extension of a severe diphtheria to the throat or larynx. In two cases I have witnessed the development of otitis media and have found the Klebs-Loeffler in the aural discharge. Diphtheria of the lips and also of the skin are phenomena once in a while accompanying the disorder.

Fourth—That a large number of pharyngeal and laryngeal cases of diphtheria are accompanied in a quiescent way with the nasal form also, and that every case of diphtheria of the throat or larynx should not be released from quarantine until at least two cultures of the nose have been reported negative.

Fifth—That a 3000 unit immunizing dose of antitoxin is uncertain as a preventive and that it protects probably only about fifty per cent. of those injected from acquiring diphtheria if closely exposed. It may be that its seeming failure is due to the fact that the case when injected already has diphtheria and that 3000 units it not a sufficient dose for its cure.

Sixth—That every case of nasal disturbance in childhood, and even in adult life, should be cultured as carefully as we now culture suspicious disturbances lower down. This rule especially should be observed in scarlet fever, measles and other contagions.

Seventh—That every case of scarlet fever and measles presenting any of the symptoms which I have enumerated as characteristic of nasal diphtheria should be cultured, each nostril separately, and this procedure should be repeated several times. Furthermore, while this is being done, such cases should be segregated from others not so afflicted and treated on the assumption that they are positive nasal diphtheria irrespective of culture returns.

Since acting along lines based upon these conclusions, the amount of nasal and other diphtheria in the scarlet fever and measles wards has been reduced to a minimum. Burrows thinks if school inspections were carried out daily and teachers were taught to bring to the notice of school inspectors every case of cold in the head or other nasal disturbance, or if the school inspector personally had each pupil pass in review before him, and every questionable case he thus detected was promptly isolated and cultured, that a large amount of diphtheria would be prevented.

Diagnostic Misconceptions.

"Ten thousand cases of mild smallpox a year in Minnesota, with hundreds of wrong diagnoses, is the cause of the spread of the disease," says Hills of the Minnesota State Board of Health (*Jour. Lancet*). He shows some diagnostic misconceptions:

"1. That chickenpox occurs only in children. It is true that the vast majority of chickenpox cases occur at or before twelve years of age, but cases in older children and even in adults are by no means uncommon.

"2. That smallpox does not invade the scalp. It is true that chickenpox usually invades the scalp while smallpox sometimes does not, but the point is by no means final.

"3. That smallpox alone invades the palms and soles. It is true that smallpox almost always invades the palms or soles, or both, but chickenpox not infrequently shows one or more palmar or plantar lesions.

"4. That smallpox lesions are umbilicated, while chickenpox lesions are not. This statement might be made almost without reservation, if confined strictly to the vesicles of the two diseases. But the umbilication of the smallpox vesicle disappears on pustulation (probably by liquefaction of the restraining bands which produce the 'dimple'), while the subsequent drying out of the pustule reproduces a pseudo-umbilication in the late pustular stage. The chickenpox vesicle, being swept off or broken, leaves the slightly pitted summit of the papular base of the vesicle exposed. On drying, and especially after crusting, the lesion thus evolved often presents a certain dimple, sometimes mistaken for umbilication. This 'umbilication' is wholly different in stage, cause, and structural features from the true umbilication of the smallpox vesicle, and should never be confused with it. It is not even analogous to the secondary umbilication of smallpox, for in the latter the epithelium covering the pustule is still intact, although dry.

"5. The smallpox lesion is often considered to be frankly multilocular, and the chickenpox lesion unilocular. While this teaching is true, histologically, in a general way, of the vesicles, and the vesicles only, the respective structures cannot be differentiated by such a crude test as pricking the vesicle with a pin. The chickenpox vesicle is broken readily, and the prick of a pin is more than likely wholly to disrupt it. The smallpox vesicle is exceedingly tough and the evacuation of one of its chambers is unlikely to permit observable collapse of the particular segment evacuated. Indeed, this test is somewhat analogous to 'differentiating' toy balloons from grape-fruits by sticking knives into them, first, because the differentiation is clear on other grounds without the knife test, and, second, because the toy balloon is destroyed by such test, its 'multilocularity' or 'unilocularity' being thus placed beyond demonstration. Any case where the conditions are such that this 'test' could conceivably be employed as a definite and sensible means of differentiating vesicles not otherwise distinguishable from smallpox—is smallpox. The true distinction is this—the chickenpox vesicle is destroyed at a touch; the smallpox vesicle is hardly to be ruptured under any circumstances without considerable violence."

Inguinal Hernia in Childhood.

The management of inguinal hernia in childhood is discussed by Campbell of Brooklyn (*Med. Rec.*). Mechanical appliances and operative procedures are given as means of cure. The treatment with the truss should begin as soon as the hernia is diagnosed. But this treatment can be efficient only when the principles of the treatment are understood and its application is in the hands of a vigilant and careful nurse. The measuring, ordering, fitting and hygiene of the truss are worthy a high order of intelligence—at least the physician should not abdicate in favor of the trussmaker.

One of the most important things in connection with efficient truss treatment is the appreciation of the fundamental principle, a truss to be efficient must be worn continuously. The support must be continuous, day and night, during the bath,

when the truss is changed. In other words, from the time the truss is applied there must not be a moment when the hernial opening is left without support. Should the child cry or cough or strain during a moment when the opening is unsupported, the hernia may again protrude and spoil the results obtained by months of treatment.

After the age of two years, if the hernia still persists, the truss should be abandoned and a radical cure performed because: 1. The chances of cure steadily diminish up to the age of puberty. 2. Truss pressure causes atrophy of the underlying muscles, thereby diminishing the protection afforded by the muscles, and lessening the chances of radical cure. 3. The wearing of a truss interferes with proper exercise and thus interferes with bodily development. The child who wears a truss is handicapped in the struggle for existence. 4. The cures by truss are often apparent, not permanent. There are many recurrences. 5. Radical operation removes at once the serious handicap with all its disagreeable sequelæ by establishing normal conditions. 6. With the age limitation mentioned above it is the author's experience that the younger the child the more satisfactory the results of operation.

Scarlet Fever and Measles.

Over 800 cases of scarlet fever were treated by Milne (*B. M. J.*) without throat, nose, ear, glandular or kidney complication. Many of the children were in the poorer quarters, where conveniences were lacking. His treatment consists in swabbing the tonsils and pharynx with 10 per cent. carbolic oil every two hours for 24 hours and longer if not regularly carried out. He uses a cotton wool swab, the size of the distal phalanx, held by forceps. The oil relieves pain and enables the patient to swallow more readily. The patient is also anointed from head to foot with pure eucalyptus oil morning and night for the first four days, and once a day for the next six days. Milne starts in at once on all suspected cases without awaiting confirmation of diagnosis.

He gives as advantages these points:

1. When this treatment is commenced early—and this is vital—secondary infection never occurs, and consequently complications are unknown.
2. With this treatment carefully carried out, children may occupy the same room, and even the same bed, without the risk of infection.
3. The economy of the treatment. An ordinary case in isolation costs ten pounds and upwards; this perhaps two shillings. Therefore it means a saving of millions of pounds annually.
4. Its household economy. The mother is free to attend both the patient and her duties. The father is free to go to work without the slightest risk, and the children equally free to attend school.
5. No after-disinfection is necessary, for the disease having been destroyed, nothing remains.
6. The author has been frequently asked about the disinfection of the patient's spoons, crockery, etc., as these are such a trouble in an ordinary household. The fact is, there is no disinfection, or in any way a keeping of them apart. They are all collected together, washed in the ordinary way, and served out indiscriminately on the next occasion.
7. In measles, as in scarlet fever, there is no necessity for the hair being cut short, neither for destroying the toys, books, etc., for these may be safely interchanged as soon as the patient is able to play. The net result is that there is no interruption of the domestic, scholastic, or business affairs of the household.

Intra-Abdomino-Pelvic Pressure.

The intra-abdomino-pelvic pressure, even that maintained during posture and rest, Paramore says subserves most important circulatory functions (*Lancet*). It not only quickens the whole circulation, but renders the blood richer and purer in a short time; and this is the reason of its far-reaching effects on general metabolism. By maintaining a high aortic pressure it lays the foundation for an efficient cerebral circulation so important to man.

Treatment

ACUTE LOBAR PNEUMONIA.

The treatment of the lobar form of pneumonia is the topic of a paper by Nammack, of Bellevue Hospital and Cornell Medical College (*Med. Rec.*, Jan. 20, 1912), who notes that the disease, as editorially mentioned in the last issue of the MEDICAL TIMES, continues to exact its toll of 20 to 25 per cent. of deaths. He doubts the reports of observers who claim a percentage recovery of 95 to 100 per cent. Nammack's 30 years of hospital and private practice has led him to follow this procedure in pneumonia:

The patient is sent to a warm bed, given a mustard foot bath in bed, his legs are rubbed for 30 minutes and an enema of two ounces of Epsom salts, two ounces of glycerin and 12 ounces of water given. No morphine is advised, unless strapping and hot applications fail to relieve the pain in the chest. Then follows ten grains of blue mass or a powder of calomel, five grains, with sodium bicarbonate, fifteen grains, to be followed in six hours by a saline laxative. Then and during the progress of the disease a high, hot, large normal salt solution irrigation every morning, and also epsom salts and glycerin enema every evening is given to prevent troublesome tympanites later in the disease. Avoid overfeeding the patients, avoid articles of diet which may produce flatulence, and forbid the use of beverages containing carbonic acid gas. Patients are fed every three hours with milk, eggs, broth, coffee, and other fluid foods, with water enough to make up an aggregate of five pints in twenty-four hours. They are not awakened from sleep at night. Sleep should be encouraged. There must be plenty of fresh air in the room at a temperature of 65°. Drugs and food should be given together if possible, and the patient's toilet wants should be attended to at three-hour intervals, and he should have absolute quietude of mind and body between these intervals.

Next, have an accurate blood count made, including a differential enumeration of the leucocytes, and have a thorough uranalysis done. A daily blood chart thereafter, with a daily examination of a twenty-four hours' specimen of urine, will keep us alert for complications. A comparison of the blood pressure with the pulse rate will also give us valuable prognostic and therapeutic indication. If the pulse rate is less than the blood-pressure reading the patient is doing very well. Low blood pressure can only result in vasomotor paralysis with consequent stagnation of the bloodstrain, so that the tissue cells lose their accustomed stimulus and are consequently constantly bathed in a solution of their own wastes. Therefore use from the outset strychnine, caffeine, alcohol, and camphor. After the crisis, digitalis may be clearly indicated. Fever requires no interference unless it becomes high enough to add to the poisoning of the vital centers. Hyperpyrexia indicates danger, and should be promptly met by the application of cold compresses, cold sponging, and ice bags to the chest. Coal tar antipyretics should never be used. Alcohol is a good antipyretic, as it reduces temperature by increasing heat loss by evaporation and radiation; it lessens heat production; and, most valuable of all, it supplies an easily oxidizable fuel to be burned up instead of the tissues.

Avoid the obscuration of the symptomatic field in pleuritic pain by morphine and make use of strapping the chest, local applications or the Paquelin cautery. Cough may also be distressing in the early stages, but here again the use of any opium preparation is a two-edged sword.

The first brain symptoms are excitation, restlessness, insomnia, and delirium, followed in severe cases by depression, stupor and coma. Aerotherapy, hydrotherapy, and elimination by the bowels, skin, and kidneys, have done something to forestall these dangers, but if pronounced they may require enter-

oclyses of physiological salt solution, or the Murphy drop method, with increase of diaphoresis by hot packs, and an ice helmet to control delirium. Insomnia may require trional in hot milk, chloralamid in cold whiskey, or, if unavoidable, ⅛ grain morphine hypodermatically. For the cardiovascular symptoms, use strychnine and alcohol for steady and continuous effects.

The dyspnea of mechanical obstruction by involvement of large portions of lung is best relieved by oxygen of the free, fresh, flowing air. Edema of the lungs, if dependent upon low arterial pressure, will be helped by intramuscular injection of adrenalin. When the patient has entered upon convalescence, keep him in a bed a week longer, carefully estimating each day the working power of his heart, and keep on a sunny porch for the second week.

Nammack says calcium chloride and sodium chloride have no deleterious effects and many ardent advocates and may be added to the measures he has advocated.

A Useful Ointment.

Those who knew Prof. Ashhurst of the University of Pennsylvania will remember his kindly ways and his courteous demeanor at all times. He was never too hurried to spare the sufficient query and the encouragement the case needed. He was confident of the virtues of a mixture of ointments of mercury and belladonna. With some amusement the writer remembers hearing: "If you are asked what to do for anything from a sprain to a broken bone, say, belladonna and mercury ointment." True. For contusions, bruises, sprains, and indeed any trauma short of fracture and in which no skin solution of continuity (to use Prof. Ashhurst's stately phrase) has taken place, order an ointment of these two materials. The addition of ichthyol is most advantageous. Dr. Edmund Holmes used to advise a few drops of phenol. This is useful in dermal conditions and when there is some danger of erysipelas. But the use of mercury must be more careful when the skin is abraded. The use of anhydrous wool fat, according to Dr. W. D. Robinson, is better than the adeps lanae hydrosus. The drying effects of the water in the latter may not be desirable.

We arrive at the following:

℞ Ichthyol ..... 5 grams
Belladonna ointment ..... 10 grams
Mercurial ointment ..... 5 grams
Anhydrous woolfat ..... 5 grams
Rose water ointment..... 5 grams
Mix. Make into an ointment.
Mark: External use. Do not renew.

The "do not renew" is needful, for the ointment makes friends, and too much mercury may salivate and make enemies.

Caffeine's Effect on the System.

In a comprehensive study of caffeine on the system, Wood (*Ther. Gaz.*, Jan., 1912) says:

"The results of my study of the action of caffeine on the circulation may be briefly summed up as follows: In therapeutic doses caffeine has comparatively little influence on the circulation, but it slightly increases the force of the cardiac contractions, thereby causing some elevation in the general pressure. The pulse-rate is usually not markedly affected, but such change as is produced is rather a retardation than an acceleration.

"My conclusions concerning the action of caffeine upon the motor system may be summed up briefly as follows: It acts as a stimulant to the reflex centers in the spinal cord; it enables the muscle to contract more vigorously without producing a secondary depression, so that the sum total of muscular work which can be done by a man under caffeine is greater than that which can be done without it. In closing I cannot resist pointing out how confirmatory of this conclusion is the universal experience of mankind with caffeine beverages. The soldier under the influence of coffee not only walks more briskly at the beginning but finishes the day's march less weary.

"My conclusion is inevitable that caffeine not only increases the vigor of the contractions of the muscle but enables it to work more economically—that is, to perform more labor on the same amount of energy. It is therefore impossible to speak of any compensatory depression following the primary stimulant effect of caffeine upon the muscle."

Ten Cases of Botulism.

A. R. McCracken, of Seattle, reports in the *Leucocyte*, January 15, 1912, these cases of botulism of which he treated two individuals of ten made ill. At a dinner for fourteen, ten ate infected asparagus; of these, two ate freely, and one died. Two men ate, but drank beer freely afterward, and were not made ill. Of the remaining six, three died. Twelve chickens, eating the scraps, all died.

The symptoms are: Ptosis of upper eyelids, hazy vision, dilated pupils, dryness of mouth and throat, difficult swallowing, loss of appetite, a peculiarly foul breath, sluggish bowels, inability to hold head erect, shallow respiration and rapid heart action upon exertion. For a long period afterward, vision may be affected, and the muscles of the neck are painful.

(This connotes an interesting neurasthenic syndrome. Why neurasthenics feel this neck weariness may be explained by a similar toxin reaction to the centers of the spinal cord associated; the circulation about the base of the brain, and the cranial nerve roots.)

The bacillus botulinus was discovered in 1895. It was found in ham and is frequently discovered when occurring in sausage. It is strictly anaerobic. The bacillus in growing produces a powerful toxin, and has an incubation period of several days. A serum has been made which is curative. Food that is infected with bacillus botulinus does not decompose, but has a rancid, butyric acid odor.

Metallic Ferments.

Robin ascribes to Paracelsus the honor of initiating metallic therapy. He says that to Bardet and himself the early use of colloid metals is due. He explains that these metals have a sort of life which may be killed by chemicals. Writing in the *Journal des praticiens*, September 30, 1911, he shows how to form such colloid agencies, which he entitles "metallic ferments." They are effected by the passage of an electric current of high voltage and weak amperage through a sterile water between two electrodes of the metal to be prepared. The particles exhibit brownian motion. Pneumonia, cerebrospinal meningitis, acute articular rheumatism, puerperal septicemia, pseudo membranous sore throats, facial erysipelas, are all favorably affected by metallic ferments. No action is noted by them in typhoid fever, pleurisy, tetanus, tuberculosis of the lungs, cancer, and lethal icterus. Robin asks us to consider the use of colloidal metals in hemorrhagic dyscrasia. There is an activation of coagulency and the leucocytes are affected. The ions of the metal are concerned in the value of these "ferments."

Renal trauma, Michelsson divides into three classes: The very slight cases which obviously require no interference; the very severe cases in which the renal vessels are torn, in which operation is imperative; and the intermediate cases which are the subject of much discussion. He advises rest in bed, tight compression over the upper abdomen, and saline infusions if needed for hemorrhage. Hemorrhage which takes place entirely into the ureter he thinks is rarely dangerous to life, and even when the peritoneum is ruptured, he objects to operation unless there is special indication for it. The most important complication of rupture of the kidney is the infection of the clot. To avoid this, do not catheterize even the bladder, to say nothing of the ureters. But when infection does occur, drainage must be instituted by operation.

Verruca Peruana: Two Reports.

I. S. T. Darling, Ancon, Canal Zone (*Journal A. M. A.*, December 23), says that this disease, known as the Oroya fever, or Carrion's fever, as it is called in Peru, is interesting on account of the peculiar bodies found in the red cells, its probable transmission by ticks and its peculiar localized occurrence, as well as by the peculiar blood picture it presents in its malignant form, there being a profound anemia. Verruca peruana is an infectous disease in which a fever of irregular type, associated with more or less severe anemia, is followed by a wart-like eruption of the skin and sometimes of the mucous or serous membranes Formerly, it is believed, it had a much wider distribution than it has to-day, being now limited to certain narrow valleys on the Pacific slope of the Andes. There are two forms; the malignant, characterized by a high irregular fever with rapidly progressive and severe anemia, the red cells falling sometimes below 1,000,000, with poikilocytosis, polychromatophilia, enormous numbers of enucleated red cells, leukocytosis and high color index. With the anemia there is vertigo, great restlessness and air hunger. The mind is clear and the mortality very high. The third or eruptive stage occurs in the small number that recover from this type. In the benign form are included the milder cases with low mortality and less definite symptoms, the patients usually following their vocations. The fever and anemia are moderate and the eruption usually of the nodular type, and lasts longer, consisting of small purplish-red spots which become papular and later develop into warty excrescences, lasting from four to six months. The incubation period is about twenty-one days and there is no natural immunity. In 1900 Barton called attention to the existence of infections by the typhoid-colon group of bacilli in these patients, and believes that they alter the symptomatology and aggravate its progress. In 1905 he called attention to certain bacillus-like elements in the erythrocytes, and in 1909 he stated his belief that the bodies were protozoa and the specific agents of the disease. This view has not been generally accepted by European authorities, because, as Darling thinks, they have only studied films after they have become broken up. These *x*-bodies appear in the blood in the "severe wart fever" and disappear about the time of the coming on of the eruption. They are always seen first as slender rod-like forms with rounded free ends, but they lose this form in a few days and become more irregularly swollen, distorted and fragmented. They stain a dark blue or purple with Giemsa stain, and in this respect differ from protozoa and suggest spirochetes. Darling thinks that they are some unique type of organism, as there is nothing exactly like them found elsewhere. An autopsy of a patient who died on a steamer coming from Peru is reported by Darling. The patient was also suffering from generalized tuberculosis and the examination suggested very strongly that the acid-fast bacilli in verruca tissues, described by various writers, are really tubercle bacilli and represent a complication rather than the disease itself. The prophylaxis of the disease consists in keeping out of the danger zone, especially at night, as that is the time when it is generally contracted. In conclusion, he says, "it should be stated that whatever the final opinion with regard to the *x*-bodies may be, the disease in all its aspects will amply repay careful study and research into the mode of transmission, relation of the *x*-bodies to the different clinical phases of the disease, the pathology and treatment."

II. H. A. Giltner, Assistant Surgeon, U. S. N., Washington, D. C. (*Journal A. M. A.*, December 23), gives a summary of our knowledge of verruca peruana or Carrion's disease, sometimes also called Oroya fever, an eruptive disease of infectious character with some resemblances to malaria and also to yaws in some of its symptoms. An organism, apparently a bacillus, has been found in the red blood-cells during the febrile stage and in the tissues of the local lesions, but much careful study will be required to say definitely what its causal relation to the disease is. Anemia is a predominating symptom and severe vertigo occurs. The disease is often rapidly fatal, but in the majority of cases there is an intermediate period of from forty days to four or five months before the eruption appears. There are two forms of this: the miliary and the globular. They may both be present in the same case. Most of the deaths occur before the appearance of the eruption, and when it appears the outlook is more favorable, especially if it comes out rapidly and is general. The prognosis is generally grave, the mortality being, according to some authorities, as high as 90 per cent. The treatment is mainly symptomatic and supporting. Contact infection has not been observed, and at present the prophylaxis seems to be confined to avoidance of the limited infected districts.

Brachial Plexus Lesions.

C. H. Frazier and P. G. Skillern, Jr., Philadelphia (*Journal A. M. A.*, December 16), give a detailed report of a case of a patient who was struck on the head and shoulders, by a man falling from the fourth story of a house, and whose symptoms pointed to an injury of the brachial plexus. The symptom-complex indicated an involvement of structures supplied by the sixth, seventh and eighth cervical nerves with impairment of function or irritation of the fourth and fifth cervical and the second thoracic. In addition to this there was some hyperesthesia in the distribution of the superficial cervical nerves of the cervical plexus and some functional disturbances of the left lower limb, possibly due to a congestion of the left anterior horn of the cervical swelling, such as might result from injury to the cells by pulling on their axis cylinder processes. For the purpose of relieving the intense neuralgia and causalgia a laminectomy was performed for the purpose of cutting the posterior root of the fifth, sixth, seventh and eighth cervical and first thoracic nerves. The operation revealed that the anterior and posterior roots of the sixth, seventh and eighth cervical nerves had evidently been torn completely from the cord and only the fifth cervical and first dorsal posterior roots were cut. They discuss the diagnosis and the symptoms at length but the neuralgia persisted. The mechanism and pathology of this and similar cases are also discussed. In spite of the fact that the prognosis is almost uniformly bad as regards complete recovery in these cases, they accept Sherren's rule that all subcutaneous injuries which give reactions of degeneration at the end of ten days should be submitted to operation. If this rule is followed, they say, the future of brachial plexus surgery will furnish more encouraging results. For the intractable forms of neuralgia following rupture of the brachial plexus, they believe section or resection of the sensory root should be recommended. The treatment of such cases is, as they point out, very variable, depending partly on the pathologic nature of the lesion, partly on its location and partly on whether the aim is to obtain radical or merely palliative results, but above all they emphasize the folly of indefinite postponement of operation.

Albumin Milk.

J. M. Brady, St. Louis (*Journal A. M. A.*, December 16), after giving a history of the use of albumin milk introduced by Finkelstein and his later modification of the method, notices the conditions in which it is applicable. These include disturbances due to errors in feeding or of nutrition. Conditions such as marasmus, enterocolitis and cholera infantum, some of which have been regarded as the result of bacteria, are due to the food itself, the offending element being the lactose, the fat only becoming so secondarily and the case in being entirely harmless. In contradistinction to the above nutritive disturbances we have the disturbances of nutrition due to infection.

and in all these conditions albumin milk is of value. It is prepared as follows: "One tablespoonful of essence of pepsin, or a rennet tablet, is added to a quart of milk which is warmed to 100 F. After fifteen minutes the milk is well curdled; the whey is then poured off. The curds are placed in a muslin bag and allowed to drip two hours. The curds are then gently mashed through a hair sieve, twelve to fifteen times; at the same time one pint of boiled water is poured through the sieve. Then one pint of buttermilk is added. As recently emphasized by Brennemann, first boiling the milk facilitates the passage of the curd through the sieve. I have always prepared the buttermilk by inoculating the fresh milk with a twenty-four-hour-old milk culture. I have been using the same culture for the past four years. The start was made with tablets of lactic acid bacilli. After the inoculated milk has stood twenty-four hours it is churned or simply beaten with an egg-beater. It is extremely important that a hair sieve be employed; metal and wire sieves found in homes will not do. The mixture is then ready for the addition of the carbohydrates. Maltose is preferred and may be added up to 7 per cent.; if this does not bring about an increase of weight, particularly if the baby is over 3 months old, 2 per cent. of flour is also added, which must be first cooked twenty minutes with a little water. The composition of albumin milk is proteid, 3 per cent.; fat, 2.5 per cent.; mineral salts, 0.4 per cent.; carbohydrates, lactose, 1.5 per cent.; plus the percentage of maltose and flour added." He has administered the food thus prepared to twenty infants, eighteen with nutritional disorders and two with diarrhea. With the exception of one case, a marantic infant which died suddenly, the results were good. In one of the cases of diarrhea the result was satisfactory, but in the other the treatment was stopped by the mother. While seventeen favorable cases are too small a number on whcih to base a definite opinion, he thinks that it promises to lessen the difficulties in difficult cases in the future.

Operative Treatment of Fractures.

The experience of Willard Bartlett, of St. Louis, leads him to believe that an open operation is justifiable in only four conditions, says *Am. Jour. Surg.* He gives them as:

(1) It should be used when one is unable to get the fragments in place by ordinary methods, or is unable to keep them held in the proper position.

(2) Operations for fracture are especially useful in old cases of non-union.

(3) It is, of course, desirable in all fresh widely open fractures, and possibly

(4) In chronically infected cases in which the bones lie bare. All compound wounds, whether suppurating or not, are to be packed and allowed to granulate. Generally speaking, the patient must always be a good surgical risk.

Nothing short of absolutely perfect approximation justifies an open operation for fracture. By this is meant a union so exact that no fracture line can be seen.

Treatment of Sarcoma With Mixed Toxins.

J. C. Oliver says that 90 per cent. of cases are uninfluenced by the use of mixed toxins in the treatment of sarcoma (*Ohio State Med. Jour.*). He does not consider the toxins will ever influence favorably a large proportion of cases, but says they do cure a small number.

Flap Hemorrhage.

The bleeding from a scalp flap whose base is not excessively broad may be controlled readily by catching the base of the flap between the jaws of rubber-covered forceps. The control of the hemorrhage here is prompt and efficient, and unless brutal, crushing forceps are used there need be no danger of devitalization of the flap.

Under the Study Lamp

UPON THE VERGE OF THE FOURTH DIMENSION.

Most of us accept the length, breadth and width of things as the completion of their existence. Three dimensions are all, and all in all, until someone asks, But what is the "fourth dimension?" Is there one? Can we be near it and perhaps touching things within it, but unconscious of its relation? Kent showed, a hundred years ago, that space and time are *à priori* facts and not gained from any particular experience. They are the bounds of mental elaboration. Can the mind be a creature whose content is tri-dimensional? In such an event the world would be of four, five or more dimensions. Indeed, this may be not a poetical or imaginative figment, but a fragmentary truth.

We may say, furthermore, that space and time, as conditions of thinking, are based upon purely mental processes and have no true existence outside mind, and that therefore the reality of dimension is destroyed for things apart from the mental projections which they possess in us. In one dimensional existence, the creature would live as in a tube, having before and behind it a point. But granting that this creature lived in such a relation to the superior dimensions that they conditioned the one dimensional tube, it would bend, although the perfectly slim creature in bending would not have any width or breadth to be affected and consequently could not feel compressed or stretched—bent—as it received the experience. But it would gain or lose experience of the points before and behind. The two-dimensional creature would, likewise, gain and lose perceptions. It would, also, fail to account for this alteration in experience.

May some series of alterations in our experiences be laid to the action of fourth dimensional forces? Thinkers have asked this frequently, but they have not gone beyond the question of what this fourth dimension might be. As such, it could not be opened. But the effects of it upon us can be. When it was suggested that Time might be the fourth dimension, it was not seen that Time is not of exchangeable value with length and the other spatial perpendiculars. But we may ask whether the element of growth and temporal projection may not be one evidence of more than the three dimensions. Sleep, blurring the perception of space and time, as the bend in the tube or the curling of the plane, occludes relationship. Can this be one of the effects of a fourth dimension? If you object, saying that the body does not vanish in sleep, we can answer that a fourth dimension, if real, would continually affect us, being in it, although not conscious of the fact, and that our personal change of relation during sleep would be parallel to the fact that we cannot see all around even three dimensions—both sides of the moon, for example—but that the moon may shine upon our backs and we not see it. We must remember that it is true that one-dimensional existence may occur in multiformly varied perpendicularity, if it exists as independent reality.

This fascinating study leads further. If we are in this superspace, the brain, or mechanism of correlating our experiences, is also there. Memory may be the register of fourth dimensional apprehension. In this way the sequence of time may be outpassed. We cannot say that this explains. But it does suggest. The phenomena of spiritism may be the evidence of superspace, and not that of immortality. It has been asked, if electricity is an evidence of two-dimensioned space. In other words, does matter build itself up from actual spatial units? The rotundity of spheres, and the attraction of aggregation, particle for particle, as in gravity, suggest that this force can and does act through space which is able to surpass three dimensions. For in the revolution of the planets we receive a temporal and succession-

united evidence of what in itself may be a non-temporal or instantaneous relation of quantity to quantity. If four dimensions exist, the linear rays of the sun may pass directly to each particle of the earth without penetrating the mass and with no difficuly of circling it, and in this event, day and night would not exist. Here we must add that the rays we perceive are within our known perpendiculars. There may be others beyond. Could they be demonstrated? Can the emanations of radium be of such a character? This becomes very difficult to say. Can the hyperbole be a path of some superspatial curve, and the entrance and departure forever one glimpse of superspace? Any fool can ask questions, but when any fool asks what becomes of time and space if they are merely the conditions under which the mind thinks of the things it experiences, then any philosopher will have to pause before replying. The fact that we do not experience in a perpendicular from opposite sides of a solid is evidence that no sensible lines connect us through superspace. It is not evidence that such lines are non-existent. On the contrary, the development of life should prepare us to foresee that the bounds of mind may become enlarged. The expression of force is that of a line, and of one moving in a straight direction. In consequence, we find sensation received as upon a plane. The perception of force, then, seems limited to solid geometry, or the correlation of these planes. The mind evidently is able to ascend from the plane to the solid, a process clearly one of synthesis. But in the moral and esthetic summations, we deal with the synthesis of these earlier solid experiences, and in moral summations we have to do with what seems like superspace. The forces of civic, ethic, esthetic and imaginative values seem to be correlated in superspace. For in them we realize the relations of forces acting as free from time and space, except insofar as they are set in action and released again upon the temporal and spatial sequences. Mathematically we perceive superspace, And in compound logistics we entrench upon the same jurisdiction. The syllogism equals a triangle. The process of mind which evolves simultaneous equations in estimations of right and wrong, founded upon elements of force, linear, therefore, in origin, may and probably does act through what is, or is analogous to, superspatial limits. The instinctive application of spatial terms to moral and esthetic values seems to indicate the line of evolution, and the similarity to mathematical progression. His conduct was straight, was crooked. The transaction was involved (turned about). His motive was clear. His purpose was absurd (mathematically irrational). His manner was blunt. Now in the qualifying term as applied to what is not conditioned by dimension, as manner, purpose, aim, conduct, we have the relationship of sensible elements transferred to superspace. We realize the nature of beauty as connecting all particles of a solid reality and immediately to us. Is this superspace?

THE CHARACTERISTICS OF TONES IN THE SCALE.

There are seven tones and the eighth in the modern European major scale, forming two tetrachords: each ascending by diatonic intervals separated by whole tones until the step from the third to the fourth tone is reached, which is a half tone. They have been characterized as:

root,	stable
supertonic,	questioning
mediant,	introspective
subdominant,	lamenting
dominant	forcing
submediant,	challenging
leading note,	modulating
octave,	emphasizing

If these relations are significant, some interesting explanation of the meaning of pure music may be approached. Program music mocks or imitates natural sounds. It gives the semblance of a cuckoo or water-mill. But absolute music expresses emotion free from the object except as emotion is shed from a perception of objects in the mind. In the comparison of related harmonies we develop compound tonal suggestions, and contrast by surprise and outgrowth. It is evident that in delirium and in unusual mental expressions, we may find important relations of tonal values. One nurse may please. Another may repel and one friend cheer while another depresses.

Distinguishing Terms.

The element of precision is of such necessity in our work that any terms clearing up the ways will afford pleasure, and not lead to a charge of pedantic or ultrapuristic activity. *Science*, for December, 1911, prints a communication asking us to distinguish among the terms, Genotype, Biotype, Clone. These are to be used in the lineal significance they exhibit, and in no way to be exchangeable. We should gain much in the word biotype, removing, as it does, any possible ambiguity in the genotype valuation.

In the same journal, another writer asks us to do away with the use of figures expressed with negative and positive exponents, and replace this enumeration with the term *micro*. Micro is not the same as *milli*. While recording these, another improvement comes to mind. Anatomists have so many variants in direction, according to posture, that superior, internal and their connections lose point. As often shown, use:

caudad,	tailwards
cephalad,	headwards
ventrad,	bellywards
notad,	spinewards

In these words we have some definitive relationship indicated. To say that a structure is caudad, is notad, is ventrad to any other point, gives clearness and even elegance to the description. As we turn here and there the internal or inferior relation is quite dissolved in the making.

A Great Hygienic Congress.

Washington will become the mecca for sanitarians from all parts of the world when the Fifteenth International Congress on Hygiene and Demography meets there September 23-28. Already assurances have been received by Dr. John S. Fulton, Secretary-General of the Congress, that representatives from twenty-four foreign countries and from practically every State and territory in the United States will be present.

Among the States which have not signified their official intention of being present are New York, Massachusetts, Pennsylvania and Ohio. Although invitations were sent to the Governors of these and all other States eleven months ago by the Department of State at the request of President Taft, none of them has as yet taken any official action in the matter. For the first time in its history of fifty years, the Congress will be held on American soil.

In connection with the Congress, and in buildings especially erected for it in Potomac Park, the greatest exhibition on public health ever shown in America will be held. The exhibit, which will be composed of eleven groups, will seek to show what America has done in the prevention of disease and the promotion of health.

During the Congress every effort will be made by the American Committee to show the foreign delegates how the United States has made possible the construction of the Panama Canal by establishing sanitary working conditions, and to assure them that after the canal is opened there will be no danger from the spread of disease from that quarter. A plan for securing uniform and comparable international vital statistics in which the United States is greatly lacking will also be presented. A concerted movement for better public health organization will be started. These and many other subjects will be discussed by the greatest experts in sanitation and public health in the world.

In the World of Science

The Highest Altitude Recorded.

The highest altitude ever reached by a sounding balloon is 18.9 miles, according to the annual report for 1911 of the chief of the Weather Bureau. The balloon was sent up at Huron, S. D., Sept. 1, 1910, and the height reached exceeded by .9 mile a balloon which ascended from Nice, Belgium, Nov. 5, 1908.

It is the custom to set free a sounding balloon, carrying eight registering meteorological instruments. The expansion of the gas at great altitudes (where the pressure of the air is extremely small) bursts the balloon, and the gentle landing of the instruments is insured by means of a parachute. This sometimes occurs as much as two hundred miles away from the place of ascent. A label attached to the apparatus offers a reward for its safe return to headquarters; and in eighty-one of the ninety-one ascents mentioned the instruments were recovered. The feature of the recent remarkably high ascents made by the Weather Bureau is they have demonstrated that the "upper inversion" —the lower limit of the region in which the air stops growing colder with ascent—is at a lower level over cyclones than over anti-cyclones. It is, however, slightly lower in winter than in summer, as found in European ascents. The lowest temperature registered in a Weather Bureau ascent was 92 degrees below zero Fahrenheit.

The official report records some other notable researches in the field of pure science. A good beginning has been made in a pyrheliometric survey of the region west of the Great Lakes and the Mississippi; i. e., the measurement of the intensity of solar radiation. This work is a response to the demands of biologists for accurate data of the amount of heat received by plants from sun and sky; as well as a contribution to the general physics of the atmosphere.

How Leeches Carry Their Young.

Female leeches of the *Clepsine* family carry the eggs on their under surface, and when the young are hatched they likewise fix themselves to the surface by means of their suckers. They remain there until they reach about one-third the length of an adult specimen, when they drop off and become independent. Recently a Russian scientist observed this fact upon no less than five species of *Clepsine* from central Russia. The number of young is variable, being usually from seven to twelve, but in the case of the *Hemiclepsis marginata* there are often as many as thirty-five small leeches fixed upon the female. If one of them is taken off, it crawls until it meets with an adult leech upon which it becomes fixed. This may even be a specimen of a different family. Sometimes the female is seen carrying the young, but there are one or two of these which are larger than the rest, and these no doubt came from outside and fixed themselves upon the female.

Smoke and Soot in the Air.

Prof. E. von Esmarch has been having measurements made of the degree to which the air of thirty cities in Austria and Germany was contaminated with smoke and soot (*Sci. Amer.*). Observations were made three times a day, viz., at 8 A. M., 12 noon, and 6 P. M. At each observation a uniform volume of air was drawn rapidly through a paper filter by means of some form of aspirator. According to the amount of smoke and soot in the air the paper was more or less darkly tinged at the end of the observation. Its color was compared with a scale of six numbered shades, copies of which were furnished to all the collaborators, and the filter was marked with the number of the shade to which it most nearly approached. Finally the filters for a whole month, at each station, were collated; their numbers being added and divided by the total number of observations, and the result being set down as representing the smokiness and sootiness of the air for the place and period in question. The results, while giving no indication of the absolute amount of smoke and soot present, furnish a useful means of comparing the purity of the air in the different cities. The contamination of the air by factories, in the large industrial centers, is made evident by the table published in connection with Prof. von Esmarch's paper; but there is also a very surprising effect due to the fires of dwelling houses, especially in winter.

Concrete Houses and Furniture.

A "poured" concrete house to cost only $1,000 is the millenium held out to the expectant householder. Edison not long since said he expected to perfect plans that would enable one to set up forms for a complete house and that the forms would be pumped full of fluid concrete mixture. Thus, in about twenty-one days, which is the time estimated it would take for the complete house to be cast, not only would the walls, floors and roof be in place, but even decorations, cornices, bath and laundry tubs and plumbing.

Edison is perfecting his ideas along these lines and meanwhile he has taken to building concrete furniture. His first piece is a concrete phonograph cabinet, finished in white and gold, costing $10. He believes this will revolutionize the furniture business and says it will be possible to completely furnish a house with concrete beds, tables, dressers, chairs, etc., for $200.

Ozone for London's Subway Travelers.

A ventilating system designed to supply 80,000,000 cubic feet of ozonized air is being installed in the stations of the London tunnel system. One of the plants has already been completed and is supplying 400,000 cubic feet per hour. This is estimated at 900 cubic feet per person each hour, as against 300 cubic feet, which is the usual allowance in buildings. The air is ozonized by passing it over electrified plates, after which it is driven by means of fans to the station and distributed through ducts.

Wireless Operated by Wind Power.

Wireless stations operated by wind power are proving a success on the Island of Curacao, according to *The Electrical Review*. There is a central station at Curacao, with a reach ordinarily of about 300 miles, and one of smaller power on each of the islands of Bonaire and Aruba. A gasoline engine is held in reserve.

Spinal Section at Level of First Lumbar.

In the *Revista Stiintelor Medicale* of Bucharest, Rumania, September-October, 1911, Colonel Calinescu, of the military service, reports a case occurring in a soldier shot by a revolver. The diagnosis of medullary section being made, no surgical intervention was attempted, but care of the general hygiene of the patient (difficult because of anesthesia and motor palsy, abolishment of reflexes of the lower extremity and of perineum, anal, urinary and sexual systems), is indicated and this the patient receives. The line of anesthesia extends around at the level of the fourth vertebra, because of the descent of fibers to their exit from the spinal column. Similar cases have been described. The work of Cushing, Young, Frazier, Abbe, Munro and others in this country, has demonstrated that early cases are operable; but in this case of Calinescu and Oprescu's, it appeals that a radiograph showed comminution of the cord and a hematoma, symptoms indicating impossibility of relief, as the damage was too extensive.

HOSPITALS AND SANITARIA

THE POST GRADUATE'S NEW HOSPITAL.

Nine hundred thousand dollars, put into a hospital plant, means close to perfection of facilities. That sum of money has gone into the New York Post Graduate Medical School and Hospital, which recently erected its skyscraper fireproof addition. Founded in 1882, the institution has progressed rapidly, and now is one of the foremost of its kind in the medical world.

The new brick and terra cotta building is eight stories high with twin tower sections rising five stories higher. The hospital will have nearly 400 beds, making it one of the largest private hospitals in point of capacity in the city.

A feature of the new building is the large number of small rooms for private patients of moderate means. Their equipment, however, equals that of the largest rooms. The furniture is of solid mahogany, and each room is provided with a telephone. The ground floor, the first, and mezzanine floors are given over to dispensaries and teaching. There is an eye and ear department and an eye and ear operating room on the mezzanine floor. Each department has an operating room in the dispensary, and there is a duplicate operating room for each on the main operating floor.

The medical wards and the X-ray rooms are on the third floor; on the fifth floor will be found the sterilizing plant and eight operating rooms, including one for septic cases and a private operating room. These open into each other. They are not large, and none of them is of the amphitheatre type. They are rather of the square type, and admirably adapted for teaching purposes. Every device known to medical science which can be of use in a modern operating room is to be found in them.

The entire sixth floor is given up to dining rooms for the nurses, house staff and the employes.

The roof features of the hospital are among those that appeal strongly to both physician and patient. The roof is high above the street, and so away from noise. The patients can either sit in the sunshine or stay under the shade of the awnings. If it is too cold or wet they can go into the little ward which is complete in itself and supplies full service in the matter of food and every requirement to the temporary roof-dweller. The tower is filled with private rooms.

Little rooms for the study of diseases—a separate room for each particular class of ailments—are scattered throughout the building. A children's intermediate ward has been provided for the care of children too old for the babies' wards and up to the age of sixteen. There is a pavilion, also, of forty-six rooms for private patients, occupying four of the five floors in the tower of the new building.

The old building also has been partly remodeled. There are two new aphitheatres on the main floor. On the first floor are the board room, and rooms for the teaching of surgery, orthopedics and general medical subjects. Teaching and operating rooms for gynaecology and diseases of the nose and throat are to be found on the ground floor. There is a large model kitchen in the basement, tiled throughout, and equipped with a splendid system of ventilation. There is also a complete refrigeration plant. The building was designed by McKim, Mead and White.

The medical school is keeping in touch with the progress of the times. Its department of tropical medicine, the lecturers in which are medical officers of the army and navy, has attracted the attention of many physicians. A department of four laboratories has been organized, with separate organizations for pathological chemistry, bacteriology, pathology and tropical medicine.

The tropical medicine department, under Dr. Jonathan Wright, will commence scientific investigation of pellagra next spring. It is believed there are 50,000 cases in the South and Southwest and the hospital authorities will attempt to locate the causative agent, in conjunction with the medical departments of the army and navy. Last year nearly 800 physicians were in attendance at the medical school.

Hospitals for Prophylaxis.

That the function of hospitals should be the prevention of disease, as well as its cure, is the opinion of a New York woman, who has added liberally to the endowment of Mt. Sinai Hospital, with the idea of prophylaxis in view. Despite stricter quarantine of communicable diseases, improved tenements and a more careful inspection of food, illness is rampant in New York, and many millions of dollars are being spent in building new hospitals and adding to old ones.

The maintenance of these institutions is a burden to the community. The situation in New York is not unlike that in most other cities. Hospitals are built to meet the increasing demands for illness, but the cause of the difficulty is forgotten. Physicians, seeking to cure a person, should seek the etiology of the disease, and not merely the symptoms. People are commencing to realize the necessity of eradicating the cause of disease and thus eliminate the need of larger hospital plants, and Mt. Sinai's $100,000 endowment for prophylactic purposes will doubtless prove a forerunner of many others.

Diet, Hygiene and Nursing

It is necessary in this day to have cooperation between the physician and the nurse. The age of the untrained nurse is past. She did her best according to her light, but the light was dim, in our modern way of thinking and the survival of the fittest has relegated her to the rear. In her place has come the trained worker, who cares for the sick along definite, scientific lines.

The modern nurse is well trained physiologically as were many of the practitioners of 50 years ago. She is well versed in the fundamentals of medicine and is the valued ally of the medical practitioner. In student days she was taught some anatomy, physiology and bacteriology, but much of this easily slips out of mind.

In inaugurating a section on nursing which will appear from time to time, the MEDICAL TIMES is glad to again call attention to some of the basic principles, which some of its readers in the nursing field may have overlooked.

Bacteriology is of such vast import that no one can fail to find the subject one of more than passing interest.

BACTERIOLOGY.*

WILLIAM HENRY BOESE, M. D.
Assistant Pathologist to Lebanon Hospital; Assistant Attending Physician to University and Bellevue Hospitals.
New York.

The subject of bacteriology is only about twenty-five years old, but upon the facts established by this science rest all of modern surgery and a large part of modern medicine. All aseptic methods of treatment had their origin in bacteriology. For nurses it is a necessity to understand its principles. You will then not have to ask yourselves what are the rules for preventing contagion and infection, but you will understand from the nature of the infecting agent or germ wherein the danger of contracting the disease lies. You will understand why the danger in typhoid fever is present in the urine and stools; in tuberculosis in the sputum; in diphtheria in the nasal and mouth secretions.

This course is intended to give you an intelligent idea of what bacteria are; of their habitat and mode of life without and within the human body; of the means by which we can destroy them; of the reaction of the body after they have entered; of the means by which the body protects itself, and finally, of the peculiarities of some of the important individual pathogenic organisms. We shall endeavor to show you in practical demonstration as much as possible of the subjects under discussion.

General Consideration:

Pathogenic bacteria comprise the most important of the groups of micro-organisms which have in common the ability to invade the living tissues of animals and plants, and so become involved in the production of disease. Under micro-organisms we understand living bodies of microscopic size. It is in the micro-organisms where the plant and animal kingdom meet on a border line. Bacteria are classed among the plants because they are able to obtain their nourishment from much simpler mechanical substances than animal cells. We may define bacteria as extremely minute unicellular micro-organisms, which reproduce themselves with exceeding rapidity, usually by transverse division, and nourish themselves without the aid of chlorophyll (that is, the green substance in green plants). We meet bacterial life between 0° and 75° C. Some live only in the tissue of human beings, others in animals, but the greater number in dead organic matter. Some require free oxygen; for others oxygen is a poison. Some have the power of moving about, while others have not.

*Lecture delivered before the nurses at Lebanon Hospital.

According to their favorite habitat, bacteria may be divided into two classes; first, those which thrive within the body of a living host, called parasites, and second, those which live on dead organic matter, called saprophytes. The saprophytes, to which most bacteria belong, are not only harmless but are most useful. Without them life could not exist. They destroy dead organic matter and prepare it for plant life through decomposition, putrefaction and fermentation. The parasites, on the other hand, are harmful and by their growth and products of growth excite many forms of inflammation and disease. We shall have to confine ourselves to the study of parasitic bacteria.

Morphology:

Let us begin by noting the shape of bacteria, that is their morphology; they may be divided into three main classes:

First, the sphere shaped;
Second, the rod shaped;
Third, those comprising a segment of a spiral.

First, the sphere shaped organism is called a coccus. When magnified about a thousand times they appear on the average a little larger than a pin point. According to their grouping these are again divided into three chief classes. First, when occurring invariably grouped in twos they are called diplococci. Examples are diplococci of pneumonia and of epidemic cerebro-spinal meningitis. Second, when occurring in chains they are called streptococci. The latter is a very dangerous germ. It is generally found in erysipelas and puerperal septicemia and in certain very severe wound infections. Finally, third, when grouped irregularly in bunches similar to grapes, we call them staphylococci. These are found in most local infections, abscesses, boils, etc.

The second chief division, or rod shaped bacteria, are called bacilli. Some are long and narrow, others are short and broad with but slight difference in their length and breadth. Examples of disease caused by this form of germ are diphtheria and tuberculosis.

The third and final main division comprising segments of a spiral are called spirilla. They may present the appearance of a short segment of a spiral, or comma shaped form, an S-shaped form or a complete spiral or corkscrew like form. An example of these is the cholera spirillum.

This covers in general the morphology of bacteria. We cannot go further into the structure of bacteria than to say that they have a fine envelope or capsule of a transparent substance, which can be demonstrated only by special staining methods in certain bacteria, as for instance, the diplococcus of pneumonia.

Those bacteria which are motile, that is move about when placed in a fluid, as for instance the typhoid bacilli, have certain fine projections of their capsule, through the movements of which they propel themselves about. Only by special staining methods can these projections, or flagella as they are called, be demonstrated. There is one form into which certain bacteria under certain conditions change, of which I wish to speak and which is very important to understand if you wish to understand a certain method of sterilization called fractional sterilization. I am referring to spore formations. At times when the conditions surrounding certain bacteria become unfavorable for growth, they change into spores. These spores are round, highly refractile bodies, which are formed in bacteria, either in the centre or at the end. Later, the membrane of the bacteria dissolves or breaks up and the spore is set free as a round glistening body. This spore is very resistant to the injurious influences of heat, dryness and chemical disinfectants. As surroundings become more favorable to the growth of the bacteria the spores elongate and gradually change back to their original form of bacteria, which is called the vegetative form. So you see we have a vegetative form and a spore form of bacteria.

After this brief consideration of the shape and form of bacteria, let us turn to the life processes or physiology of bacteria.

Virulence:—

From the shape and form of bacteria we cannot determine their power of doing harm. Two germs may look and grow exactly alike, but one may have lost the power of developing in the body and of producing specific poisons, while the other may be very poisonous. In other words, a germ which under favorable conditions of growth may be very poisonous, may by being subjected to unfavorable conditions be so weakened that it can no longer develop in the body and produce specific toxins. This changeable quality in a germ is termed its virulence. It is its power to grow and produce poisons or toxins. Thus in certain epidemics of typhoid the type of germ may be very virulent and cause a large mortality, while in another epidemic a weaker germ may prevail and the mortality is accordingly low.

Relation to Oxygen:—

The majority of bacteria require oxygen for their growth, but a few fail to grow unless it is excluded. Between these two extremes there are some which can grow either with or without the presence of oxygen. Those which require oxygen are called ærobic; while those which require its absence are called anærobic. Those which get along better with oxygen, but can develop without it, are called facultative ærobic bacteria. Those which can grow better without oxygen are called facultative anærobic bacteria.

Effects of Temperature Upon the Growth of Bacteria:—

Bacterial life is possible between 0° C. and 70° C., but few grow well under 10° C. or over 40° C. Pathogenic, that is disease producing, bacteria develop between 5° C. and 43° C. The normal body temperature is 37° C. This is the temperature at which pathogenic bacteria show most vigorous growth. By raising or lowering the temperature from 37° C. the conditions for development are made less favorable and consequently their growth is retarded.

Effects of Low Temperature:—

Temperatures even far under 0° C. are only slowly injurious to bacteria. They have been subjected to a temperature of —175° C. by immersing them in liquid air kept in an open tube for two hours and 15 to 80% were found to still grow when again placed in favorable conditions.

Dr. Park found about 10% of the typhoid bacilli alive after thirty minutes exposure to this low temperature. Staphylococci were more resistant. Spores were scarcely killed at all. This accounts partly for the epidemics of such diseases as typhoid after a thaw in the spring following the frost of winter. The low temperature does not kill the bacteria but simply keeps them from developing. In the warmth of spring they revive and begin to be active again.

Effects of High Temperature:—

With high temperature it is different. There are no non-spore bearing bacteria which when moist are able to withstand a temperature of 100° C. even for a few minutes. That means that when we boil anything in water all vegetative bacteria are destroyed. A long exposure to temperatures between 60° and 80° C. has the same result as a shorter one at the higher temperatures. Ten minutes exposure to moist heat at 60° C. will kill the cholera spirillum, the streptococcus, the typhoid bacillus, and the gonococcus, and at 70° C. the staphylococcus, which is one of the most resistant pathogenic organisms which have no spores.

Dry heat is less destructive to bacteria than hot water or steam. A large number of organisms can occasionally resist a temperature of over 100° C. dry heat for an hour. A temperature of 120° to 130° C. dry heat maintained for 1½ hours will destroy all bacteria, in the absence of spores.

Resistance of Spores to Heat:—

Spores retain their power of germination for years without either nourishment or water. They possess a great power of resistance to both moist and dry heat. Dry heat is comparatively well borne, many spores resisting a temperature of 130° C. for as long as three hours. Exposed to 150° C. for one hour practically all spores are killed. For this reason, when we wish to sterilize glassware by dry heat, we expose it to 150° C. for one hour. Moist heat at a temperature of 100° C., that is boiling water or free flowing steam, destroys the spores of known pathogenic bacteria within fifteen minutes.

Practical Use of Heat Disinfection:

Since most known pathogenic bacteria produce no spores and the spores of a few that do develop them are quickly destroyed by the temperature of boiling water, we need resort only to simple boiling water and streaming steam in sterilization.

Fractional Sterilization:—

There are times when we wish to sterilize substances which would be destroyed by temperatures high enough to kill spores. Such substances are nutrient media, food, etc., consequently we resort to fractional sterilization. The property of spores when placed under favorable conditions to change into vegetative form is here taken advantage of. By heating the fluid up to 55° to 70° C. for one hour the vegetative forms are destroyed, but if spore-bearing germs are present the spores are not destroyed. By letting the fluid remain at about 20° C. until the next day most of the spores change to the vegetative forms and by again heating up to 55° to 70° C. all germs are practically destroyed. Therefore, to sterilize a fluid medium we generally heat it on six successive days up to 55° to 70° C. for one hour, allowing it to stand during the intervening time at room temperature. For media that will not be harmed by heating to 100° C. heating for three successive days to that temperature for twenty minutes each time usually suffices.

Pasteurization:—

Since temperatures that will kill spores have a deleterious effect upon the food values of such substances as milk, we often raise the temperature just high enough to kill all vegetative forms while spore forms will remain alive. As there are but few spore bearing pathogenic bacteria, about 90 to 98% of the bacteria are killed by this amount of sterilization.

The materials and methods used in the cultivation of bacteria will be demonstrated to you practically.

Effects of Various Deleterious Influences Upon Bacteria: Light:—

Probably the majority of bacteria are inhibited in growth by the application of bright daylight. Direct sunlight inhibits the growth of all bacteria and if its action is prolonged the bacteria die. By experiment it was found that the typhoid bacillus or anthrax were killed by direct sunlight in 1½ to 2½ hours, depending upon the season of the year. Koch showed that the tubercle bacillus is destroyed by direct sunlight from a few minutes to several hours, depending on the thickness of the layer exposed and also on the season of the year.

Influence of One Species Upon the Growth of Another:—

In nature bacteria often occur in mixed cultures, that is, bacteria of one species grow with several other species. Thus in water, milk and intestinal contents there are various species of bacteria together. All species will not grow together. Some species will not grow when in close proximity to certain other species, while again, in the presence of certain other species of bacteria, they will grow better. Thus, animals infected with anthrax may often be cured by a secondary infection with the streptococcus, while the tetanus germ, although anærobic, will grow even with the admission of air, if only other ærobic species are present.

Duration of Life in Pure Water:—

As most pathogenic species of bacteria require much organic food for their development, when placed in distilled water they die within a few days. Even in sterilized well water or surface water their life duration does not usually exceed eight to fourteen days, and they rarely multiply.

Effect of Drying:—

The effect of drying vegetative forms of bacteria is variable. Thus cholera spirilla have been found to live from a few hours to 200 days when dried. But even when a dried culture lies for a long time, the majority of organisms die within a few hours after drying. Colon bacilli were found by Dr. Park to be reduced from 1,500,000 to 100,000 after three hours drying.

TEACH HYGIENE IN PUBLIC SCHOOLS.

This excerpt from the report of the Section on Preventive Medicine and Public Health of the American Medical Association last June should be committed to memory by every physician:

"The most promising soil in which to plant the seeds of hygiene is the public schools. The minds of children, being plastic and receptive, will readily accept and assimilate new truths, and these becoming a part of the composition of the child will find practical expression when adult age is reached. It sometimes seems to be a waste of time to try to secure the action of adults in the matter of the practical application of well-known hygienic truths. They, in considering the matter, remember they have survived, and then draw wholesale conclusions to the effect that the truths and arguments presented in regard to disease prevention are all bosh.

"The advice given by President David Starr Jordan is certainly sound: 'If ever you wish to go in for philanthropy, if ever you wish to be of any use in the world, do something for little children.' And further, 'If the great army of philanthropists ever exterminate sin and pestilence, ever work out our race's salvation, it will be because a little child has led them.'"

Miss Agnes Morris, State organizer of school improvement leagues in Louisiana, and one of Dr. Dowling's principal assistants, made over 400 talks last year, relative to teaching hygiene in the public schools. She inaugurated medical inspection in many schools, had a morning exercise set aside once a week for the purpose of instructing children in personal hygiene and brought about the observance of Public Health Day, an unusual accomplishment for one woman.

THE OUT-DOOR SCHOOL.

Physicians are recognizing in daily increasing numbers the importance of teaching sickly children out of doors. Reports on the value of this method are universally satisfactory in this country. In England we find they are obtaining a firm hold. The new open air school in Birmingham is described in the consular reports as being the most elaborate in Great Britain. The main building consists of dining rooms, bath and drill rooms, and a central clock tower. The pavilions of the classrooms number three; they are open on three sides, and are provided with folding glass shutters in order to furnish protection. However, it is the intention to give all instruction in the open air when possible and to use the classrooms only in inclement weather.

An important part of the treatment is absolute rest for the pupils for from one and one-half to two hours daily in the daytime. In pleasant weather the children will sleep in deck chairs and in a "resting shed" in bad weather. They will be kept warm by rugs and will wear what is known as a French cape. Physical exercises will be provided for the children under the direction of the medical officer, and each child will have its own garden, the ground being laid out in plots. Three meals will be served daily, and the kitchen, a large airy room in the upper story of the main building, will be used for cookery lessons for the girls.

A handsome suite of baths has been provided and each child will have at least one bath a week. This is regarded as one of the most important parts of a curriculum devised for the purpose of teaching citizenship, and excellent results have followed the installation of baths at two of the schools in the poorest parts of Birmingham. The desks and chairs provided are so fashioned as to give the needful support and comfort to young and weakly children.

The school is to be kept open all the winter, and the average stay of a pupil will be from three to four months. Each child will be examined at least once a week by a test of its blood and the hemoglobin scale, which clearly shows the amount of oxygen-carrying element in the blood, will be used. The children will travel each day to and from the school, which is situated about three miles from the center of the city, on the city tramways, special passes being issued to them. The school is for delicate and weakly children, not suffering from tuberculosis, and represents an earnest and what it is hoped will prove an effective method of counteracting the deteriorating influences of slum life.

Thirty-one children were admitted the first day, and there are now eighty in the school. These children have been carefully selected from the elementary schools and are children who are, from environment or perhaps heredity, too weakly to derive any real educational advantage from attendance at the ordinary elementary schools of the city.

DIET IN KIDNEY AND HEART DISEASES.

At the Cornell University Medical College Clinic patients with kidney disease are given these instructions as to diet:

Dairy foods.—Milk, cream, butter and a small amount of cheese. *Cereals.*—Rice hominy, Indian meal, barley, cracked wheat, oatmeal, cream of wheat. *Breads*—Whole wheat, graham, rye, corn bread. *Vegetables.*—Potatoes, beets, carrots, onions, turnips, squash, lettuce, spinach, tomatoes, peas. *Fruits.*—All the fresh fruits, except bananas. *Liquids.*—Drink no alcoholic liquors of any kind, not even beer. They are all absolutely poisonous to anyone with kidney disease, and are likely to cause dropsy, shortness of breath, or convulsions, and destroy your eyesight, besides shortening your life. Do not drink large quantities of water or other liquids.

Avoid all red meats, and eat eggs only in moderate quantities. *Avoid* all salted or dried or canned meats and vegetables.

For persons suffering from cardiac disturbance this dietary is advised:

Meat.—Boiled, broiled or roasted meat once a day. *Dairy Products.*—Milk, cream, butter in moderation. *Cereals.* Rice, hominy, Indian meal, barley, cracked wheat oatmeal, cream of wheat, etc. *Bread, at least a day old,* whole wheat, rye, graham, corn bread. *Eggs.*—Cooked in any way except *fried. Vegetables.*—Potatoes in small quantities, beets, carrots, squash, lettuce, spinach, tomatoes, peas.

Avoid canned, salted, or fried meats. It is better to eat small meals frequently than too much at one time.

Do not drink much water or fluid of any kind at one time; it overloads the stomach and strains the heart. Drink water several times between meals, not with meals, and do not take more than a tumblerful at one time.

TREATING TUBERCULOSIS AT HOME.

The home treatment of tuberculosis should be carefully watched, says Lloyd (*Va. Med. Semi-Month.*), who thinks the percentage of cures is large when diagnosis is made early in the progress of the disease. He recommends this daily regime:

7:30 A. M.—Cold sponge bath in a warm room.
8:00 A. M.—Breakfast.
8:30 to 9:30—Rest on a reclining chair out doors.
9:30 to 11:30—Exercise or rest.
10:30—Nourishment.
11:30 A. M. to 1:00 P. M.—Rest on recliner.
1:00—Dinner.
1:30 to 4:00—Rest on bed.
4:00 to 5:30—Exercise or rest.
4:30—Nourishment.
5:30 to 6:00—Rest on recliner.
6:00—Supper—after Supper light recreation.
8:00—Nourishment.
9:30—Bed—sleep out doors.

FRESH AIR SCHOOLS.

The open air school is the subject of a paper by Wheaton of Providence (*Prov. Med. Jour.*), treating the school in Pawtucket. We quote his conclusions:

"The children are not only taught the benefits derived from fresh air, but also what cleanliness means. They are all made to thoroughly wash and brush their teeth before luncheon and dinner. Certain children are selected each day to set the table, clear off the table and wash and put away the dishes. One or two of the older ones are instructed in cooking the few dishes that are served. Both personal and outward cleanliness are in this way taught.

"A great deal of the success of a school of this kind depends upon the character of the teacher. No teacher who has had long experience in the old unsanitary, unventilated school rooms should be employed, rather a recent graduate who gives every evidence of becoming an earnest and willing worker in the open-air method.

"The children are thoroughly examined physically twice a year and a card filled out with the finding of the examination, while once a month the children are weighed, and this is also recorded. The teeth are also examined by a dentist and such work done as seems necessary.

"For the school year from September 12, 1910, to June 16, 1911, the enrollment was twenty-one children. The average attendance for the year was 17.8, and the percentage of attendance was 87. The absences were due in the majority of cases to lack of clothing and work to do at home, or in few cases, colds and trouble with the teeth were the causes. All the children gained in weight from four to twelve pounds. The general health of all the children was much improved, coughs were seldom heard, colds were rare, and the endurance of the children was greatly increased. Very noticeable improvement was shown in the mental condition. They were in many cases able to do more than the required work. Fatigue was never noticed at the close of school, while there was very seldom present irritability or nervousness. Four of the pupils graduated at the end of the year and were enrolled in the regular public school. This is a great gain, both mentally and physically, over the present shut-in method of school instruction."

THE APPLICATION OF SILK IN NURSING.

1. Some nervous patients have difficulty in maintaining an equilibrium of heat at night. For them, in the bed, and under the lower sheet, a spread of silk is useful. This silk sheet will not become soiled by ordinary use. It may be made of silk remnants, or of undyed China silk. To preserve equal tension, it should be attached by safety pins to the mattress. For other nervous cases, and when a silk spread is not available, use an extra woolen blanket. To place a patient upon a linen sheet resting directly over a mattress will often cause an unequal diffusion of heat. Over the patient we lay a blanket, sheet, spread and down comforter. These do not pass under him, and when he complains we add another blanket, or a hot water bottle. The physician should often raise the lower sheet of his patient's bed to see what provision for heat diffusion may exist, and he will uncover the cause of many a restless night.

2. Silk underwear has the sound of luxuriance, of even effete splendor. On the contrary in silk undergarments we find a very good means of restoring the power of the skin to equalize heat. We find that a silk jacket, often advised in bronchial colds, will aid in health, and the advantages of silk, properly used, are those of durability, and the more gradual response to thermal and static changes. For emergencies, any loosely fitted undervest or jacket will serve. Nether garments of silk are indicated for those exposed to extreme depressions of temperature, and for them a double garment may serve better than the heaviest woolen materials. Expense is largely a matter of reasonable care in cleansing.

3. Silk sheets may be used in cases of rheumatism with great relief. Remnants of China silk are not always expensive and they wear well. For rheumatoid arthritis and for chronic articular forms of rheumatism this is suggested in the belief that linen is unsuited to their dermatic conditions.

4. Blankets of a silk and cotton mixture are very warm, and these, even in bright colors, may be used over the upper sheet covering the patient.

5. The sight of bright colors may very agreeably stimulate a neurasthenic. For such, and for melancholics or mental cases able to react, the employment of the gay silk blankets used by college men and women is an excellent device. The cheery effect of these stripes and of the Navajo designs of other blankets, but especially of those silk and cotton mixtures sold for from one to two dollars, and available in almost any instance, will be perceived readily. The physician will enjoy the effect of a tasteful stimulus of this kind exerted upon his patient.

Good Health Promises.

School children all over the country might well follow the example of some boys and girls in an Alabama school, who formed a Good Health Club (*Bull. La. State Board Health*), with this membership pledge:

"I promise:

"1. To be as regular in my habits as I can, to rise at the same hour, retire at the same hour, eat my meals at the same hour each day and not to eat between meals.

"2. Never to sleep in a room without having at least one wide open window.

"3. To choose food that is nourishing and to stop eating when I have enough.

"4. To drink at least eight glasses of water each day, two before breakfast and two before dinner, two after school and two before retiring.

"5. To walk and sit with head and shoulders well up and chest expanded.

"6. To fill my lungs with fresh air before each meal.

"7. To spend as much time in the sunshine as possible each day.

"8. To avoid strong stimulants of any kind.

"9. To brush my teeth every night and morning.

"10. To bathe frequently so as to keep all the pores in my body open."

A Loan Fund for Nurses.

The trustees of the Buffalo General Hospital, recognizing the financial necessities of many of the pupil nurses, have established a Loan Fund to be administered as follows:

First: Such loans shall not exceed an aggregate amount of $75.00 to any one person, and shall be granted only to such as have proved themselves worthy and who have been in the school for a period of not less than one year. In this connection, however, it is further recommended that should instances arise wherein, because of unusual circumstances, it is deemed advisable to advance funds to a pupil before the expiration of the first year of work, the President shall act at his discretion.

Second: Such loans shall be covered by a demand note in favor of the Hospital, bearing 3 per cent. interest from date, but with the understanding that no call for payment shall be made before the first year after graduation.

Third: These loans shall be made on the recommendation of the Superintendent of Nurses, subject to the approval of the President.

Fourth: The fund and all notes covering loans from it shall be in the care of the Superintendent of the Hospital, and a proper account be kept of it.

A Pension Fund.

The pension fnud of $60,000 has been raised by the alum næ of Mt. Sinai Training School, New York, during the past year. After twenty years of service nurses will be eligible to a pension from the income from this fund.

It may be noted in passing that the endowment of Mt. Sinai is now $315,000.

The Physician's Library

A Handbook of Practical Treatment.—In three volumes. By 82 eminent specialists. Edited by John H. Musser, M. D., Professor of Clinical Medicine, University of Pennsylvania; and A. O. J. Kelly, M. D., Late Assistant Professor of Medicine, University of Pennsylvania. Volume III: Octavo of 1095 pages; illustrated. Per volume: Cloth, $6.00 net; half morocco, $7.50 net. Philadelphia and London; W. B. Saunders Company; 1912.

The last volume of this treatise on treatment is in keeping with the high standard set by its predecessors. It considers constitutional diseases, diseases of the respiratory, digestive, urinary and nervous systems and of the mind. A valuable feature is the admixture of surgical treatment with the medical. A good example of this is seen in the section on diseases of the digestive system, in which are most instructive contributions on surgery of the esophagus, of the stomach and duodenum, of constipation, of the liver and gall bladder, and of visceroptosis by such experienced operators as the Mayos, J. G. Clark, Roswell Park and Gibbon. As the name of the work indicates the major part of the text is devoted to treatment. Not many of the 38 authors give up much space to pathology. After a brief consideration of etiology, they plunge into treatment and every subject is exhaustively handled. There is an absence of the dry and formal style that characterizes too many of our text books. This volume is refreshing in the extreme and from the standpoint of actual clinical value it is as helpful a work as we have seen in a long time.

Handbook of Physiology.—By W. D. Halliburton, M. D., Professor of Physiology in King's College London. Tenth edition (23rd edition of Kirke's Physiology). 923 pages and 600 illustrations. Cloth, $3 net. Philadelphia; P. Blakiston's Son & Co. 1911.

Those physicians who studied medicine more than ten years ago will gladly welcome this volume, for it is an up-to-date reminder of an old and true friend. Who of those men did not revel in the mines of information contained in Kirke's Physiology, written by Baker and Harris of St. Bartholomew's Hospital, London?

Now there comes to us the old book in new dress, with over 200 more pages than the edition of 1890. It has a wealth of illustration and much of the text is new, but as we read it our mind persistently goes back to halcyon student days. The old Kirke was good, but the new Halliburton is far superior. To be sure this is a tenth edition of the newer physiological work and physiology does not change like other branches of medical study, but at that we note many additions and deletions.

The volume continues the most authoritative work on the subject which we have seen and the latest edition leaves little to be desired.

Infections of the Hand. A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hands and Forearm.—By Allen B. Kanavel, M. D., Assistant Professor of Surgery, Northwestern University Medical School, Chicago. Octavo, 447 pages, with 133 illustrations. Cloth, $3.75 net. Philadelphia and New York; Lea & Febiger. 1912.

That ancient bromide, "why did no one think of that before," instinctively comes to mind when one glances at the title of this book. The importance of the members, which are considered in the volume, are so apparent that the wonder is bright writers of other generations neglected the field. Dr. Kanavel is one of the most capable of the younger surgeons of Chicago and he has drawn the clinical material for written demonstration from his own wide experience.

We did not recognize the necessity for a special treatise on the hand until we became acquainted with this splendidly arranged book. It will prove helpful to the surgeon but it will be indispensable to the general practitoner, who may have overlooked many important facts as to carpal surgery, which Dr. Kanavel has recalled. The physician who gives heed to the axioms set forth in this work will be of much greater value to those who consult him for affections which have origin in the hand.

The Surgical Clinics of John B. Murphy, M. D., at Mercy Hospital, Chicago.—Volume I, number 1. Octavo of 133 pages, illustrated. Published bi-monthly. Price per year: Paper, $8.00; Cloth, $12.00 Philadelphia and London; W. B. Saunders Company. 1912.

The clinics at Mercy Hospital, Chicago, which have been an important feature of Dr. Murphy's work, are to be perpetuated in the form of bi-monthly monographs, containing a verbatim report of these lectures to physicians.

The first of this series was issued on Feb. 1. Among the more interesting lectures are those on carcinoma of the breast, varicocele, salvarsan, exploratory laparotomy, Charcot's disease of the hip joint, pelvic tumor and duodenal ulcer.

The profession is to be congratulated that this valuable clinical material is to be put into such shape that the lectures can be preserved. No more instructive surgical talks are given in this country and a wide clientele is assured the president of the American Medical Association.

The Wassermann Sero-Diagnosis of Syphilis in its Application to Psychiatry.—By Dr. Felix Plaut of Munich. Translation by Smith Ely Jelliffe, M. D., Professor of Psychiatry in Fordham University, and Louis Casamajor, M. D., of the New York Neurological Institute. 188 pages. Paper, $2.00 net. New York; Journal of Nervous and Mental Disease Pub. Co. 1911.

This monograph, one of seven edited by Drs. Jelliffe and White, takes up the development of the Wassermann reaction and its application as a means of diagnosis to the field of psychiatry. After discussing the utilization of different methods and the necessarily complicated technique, the major part of the book is devoted to the results of clinical investigation. From the work done by Plaut we are convinced that the Wassermann reaction will prove of value to general practitioners who occasionally come in contact with mental diseases. To the specialist it will be of almost daily assistance.

Among the other interesting monographs issued by the same company are Selected Papers on Hysteria and Other Psychoneuroses, Epidemic Poliomyelitis and Freud's Three Contributions to Sexual Theory.

Practical Electro-Therapeutics and X-Ray Therapy.—By J. M. Martin, M. D., Professor of Electro-Therapeutics in Baylor University. Cloth, 446 pages, 219 illustrations, $4.00 net. St. Louis; C. V. Mosby Co. 1912.

This is a valued addition to the literature on this subject. It is comprehensive, free from technicalities, and written for the purpose of instructing the physician who wishes to make use of the assistance granted by electricity in its varied forms. The sections devoted to the X-ray are especially interesting and are pregnant with helpful thoughts.

The book is a credit typographically and the illustrations are excellent. We commend Dr. Martin's work to those following the subjects treated as one of much worth.

Tobacco Facts.

Here are some facts on tobacco in the United States, taken from the internal revenue reports from 1911:

Output of large cigars in 1911, 7,270,144,822; increase, 200,336,076.

Little cigars in 1911, 1,207,748,118; increase, 160,010,239.

Cigarettes in 1911, 9,828,682,005; increase, 1,184,124,915.

Manufactured tobacco, pounds, 389,865,917; decrease, 54,275,433.

Taking the length of the average large cigar as four inches, the total consumed in the United States in the year 1911, if laid in a straight line, would girdle the earth eighteen times, while the cigarettes turned out, if measuring only three inches on the average, would girdle the globe nineteen times.